8 MM LEBEL CARTRIDGES

Jean Huon & Alain Barrellier

Crepin-Leblond

Editions

8 MM LEBEL CARTRIDGES

WARNING

The law of March 11, 1957, which prohibits the reproduction of literary, technical, or artistic works, was promulgated before the appearance of photocopiers, scanners, multi-media networks and other materials which must remain tools of work and not instruments of fraud.

The author and the publisher solemnly warn those persons who would be tempted to use those methods to illegally reproduce all or part of this work, that they would be guilty of a crime that will be prosecuted before the competent courts, regardless of the rank or activity of the person or service in question!

Any infringement of the various rights guaranteed by the Intellectual Property Code constitutes a crime. This applies to both the counterfeiter and the holder. Criminal penalties can reach 300,000 euros and three years' imprisonment. This can be increased to 500,000 euros and 5 years' imprisonment if the crime is committed in an organized gang.

This notice is addressed to individuals, associations, and civil or military organizations, whether French or foreign.

Dura lex sed lex!

JEAN HUON & ALAIN BARRELLIER

8 MM LEBEL CARTRIDGES

Crepin-Leblond

Editions

8 mm Lebel

Old French regulatory cartridge adopted in 1886. It became material of war on April 18, 1939 and was not declassified as such until August 2, 2013. It was CIP certified in February 2016.

Foreword

We have in several preceding works recounted the history, the genesis and described the manufacture and utilization of 8 mm arms in French regulation. In order to supplement this information, it is also necessary to talk about their ammunition. We know with what eagerness General Boulanger hastily adopted a new repeating rifle in caliber 8 mm. At the same time, smokeless powder was realized and we were already interested in a reduction in caliber. In order to respond with urgence to the desires of the Minister of War, our military engineers had no choice but to adapt what already existed, namely the case of the Gras cartridge whose shoulder had been necked down to receive an 8 mm bullet. This resulted in a cartridge whose case body has a double taper, which also suited the method of feed of the Mle. 1886 rifle which was equipped with a tubular magazine. The new rifle has more than three million examples manufactured in a few years and it equipped the active army and a large section of the reserves. It also has excellent ballistic performance, which was only strengthened by the adoption of the balle D in 1898. If the cartridge was satisfactory in the repeating rifles as well as in the weapons of the Berthier system which succeeded the Lebel, things became more complicated when it came to feeding automatic weapons. For machine guns the cartridges were mounted on strips and did not pose a problem; this is in contrast to the machine-rifle where we are forced to create semi-circular magazines whose function is random. Since being placed in service, the 8 mm Lebel cartridge is made on a grand scale and despite several teething defects it is satisfactory, so much so that it is produced in France for the needs of the Army and the government until the start of the 1950s. It also gives rise to numerous variants adopted or that remained in the prototype stage and which make collectors happy today. With the reclassification of 8 mm arms in category C or D, the 8 mm Lebel cartridge interests shooters of regulation arms. The cartridge is still produced in Serbia and we find now find in the commercial market reloadable casings in this caliber. Moreover, some French industrialists did not hesitate to put balle D or similar back in production. It is all these historical or contemporary munitions that we invite you to discover in this book.

Jean Huon

Table of Contents

CHAPTER **1**

The Munitions

The powders

The study of arms of the Lebel and Berthier systems, and the munitions related to them, requires a brief recounting of the evolution of powders.

Black powder

Since the 7th century, the Chinese know of a cannon powder which, by the intermediary of the Orient, then the Arabs, arrived in the West several centuries later. This substance results from a mixture of saltpeter (potassium nitrate), charcoal and sulfur, it is easily flammable and detonates when confined. During these centuries, it experiences diverse applications for producing fire and explosion, with these applications mostly military. It was possible to vary its characteristics, i.e. its combustion rate or its explosive capacities, by varying its grain size or using charcoals from different species. Despite the improvements made to its manufacture, black powder remained a delicate explosive, it fouled its arms and produced a lot of smoke in exploding.

Cheddite

In 1785, the French chemist Bertholet discovered potassium chlorate which he substituted for saltpeter in the manufacture of black powder. But the result gave a product that was very instable and particularly corrosive. We then searched for a stabilizer by means of addition of other chemical components and therefore we make in Cheddes, a hamlet of the Passy municipality in Haute-Savoie, a new explosive that we will designate cheddite.

Cheddite is composed of potassium chlorate, dinitrotoluene, stabilized by addition of nitroaromates (nitrobenzene or dinitrotoluene), or ricin oil. It gives good results if it is packed and was notably used in quarries.

NITROCELLULOSE

Several chemists contributed to research on nitrocellulose:

- The French Theophyle-Jules Pelouze in 1838;
- Another Frenchman, Dumas, in 1845;
- The Swiss Schonbein in 1848

Cellulose nitrate, or fulmicoton, or cotton-powder, or pyroxyl, is a product obtained by the action of a mixture of nitric and sulfuric acid (pure cellulose), it is available in several variants:

- Collodion (or binitrocellulose), obtained after kneading in a mixture of alcohol and ether, it finds applications in the manufacture of explosives, but also in photography and plastic materials;
- Fulmicoton (or trinitrocellulose), it is included in the composition of powders and explosives, but it cannot be used alone.

Nitroglycerin

Also called glycerol trinitrate, nitroglycerol or trinitrine, nitroglycerin is obtained by chemical action of glycerin on a mixture of nitric acid and sulfuric acid. We then obtain a liquid substance which becomes a powerful explosive, but very unstable because it detonates on a simple impact.

It was discovered by Ascanioi Sobreto in 1847. Its industrial manufacture was then realized by Immanuel Nobel and his son Alfred in 1862.

Dynamite

Alfred Nobel created a powerful explosive in mixing black powder with nitroglycerin, but the product remained with great instability. He then had the idea of mixing nitroglycerin with a mineral substance: kieselguhr. It is then packaged in the form of a firecracker enveloped in wax paper and fired by means of a mercury fulminate primer (1867).

Mercury fulminate

Explosive substance obtained by action of nitric acid on mercury, then refined with ethyl alcohol. Mercury fulminate detonates with a shock and, mixed with other chemical products, it is used to fire powders and explosives.

Picrated powder

Between 1865 and 1869, research is performed by de Bordinello, de Brugerer, and de Designolle. They discovered that picric acid can be usefully employed in the manufacture of explosives. Picric acid, when heated or lit, burns with a thick and slightly sooty yellow flame.

The German Sprengel notes from 1873 the eminently destructive effects it can produce when used under certain conditions.

Melinite

The French Eugene Turpin, resuming the work of Peter Woulfe, obtains and stabilizes melinite in 1885 which is produced from picric acid (trinitrophenol). It is the result of the mixture of 70% picric acid and 30% collodion. It was used notably in 1914-1918 to charge the shells and destructive bombs.

Poudre B

Smokeless powder was invented by Paul Vieille in 1884. He manages to create a new substance which, contrarily to its name, is not a powder and is not (quite) smokeless. In particular, he discovered that by causing cotton to lose its fibrous structure via gelatinization, a mass is obtained, the explosion rate of which can be regulated via the thickness and the chemical composition of the material. He used a mix of 68% fulmicoton and 30% collodion, with ethanol and ether added. When ignited, ethanol burns while other adjuvants provide the necessary oxygen while slowing combustion. The increase in pressure is therefore gradual. First designated poudre V in honor of its inventor, it was renamed poudre B a short time after. According to the sources, B was chosen in honor of General Boulanger, minister of war, or to mark the difference between black powder and smokeless powder, also designated poudre Blanche.

Shortly after being placed in service, poudre B is improved in 1887 by addition of diphenylamine, which makes it more stable. It is available in several variants.

- Poudre BF (rifle powder);
- Poudre BC (cannon powder);
- Poudre BGC (powder for large calibers);
- Poudre BSP (powder for siege and fortification artillery);
- Poudre BTR (for rapid-fire cannons);
- Poudre BM (powder for the navy).

It was then improved several times:

- Poudre BFNT, new type (1888);
- Poudre BFAM for new primer (1895), with addition of amyl alcohol;
- Poudre BN with nitrocellulose nitrate base, it was available in several variants; BF-NT (new type), BF-AM (with addition of amyl alcohol), BNG with flat grains of dark brown color, BN-2F utilized by the S.F.M. for charging cartridges in shooting company stands and BN-3F, with addition of potassium nitrate and barium (1894).

Balistite

Invention of Alfred Nobel (1887), it is obtained by mixing 50% nitroglycerin and 50% fulmicoton.

Cordite

British variation of balistite, it contains 58% nitroglycerin, 37% fulmicoton and 5% vaseline. It gains its name from the filamentary form that it was given in its first applications. It was produced by the English Royal Powder Factory at Waltham Abbey.

Other smokeless powders

Very rapidly, numerous countries also create smokeless powders:

- Germany: Rottweil powder of nitrate cotton stabilized by diphenylamine, with a lower nitroglycerin content at 30%;
- Austria (colodine or Schwab powder);
- Belgium: Wetteren's L3 powder;
- Great Britain: cordite;
- Italy: solenite, variant of balistite, composed of 60% nitroglycerin, 40% soluble nitrate cotton and 1 to 2% diphenylamine, it is the dynamite factory at Avigliana that ensured its manufacture;
- Low Countries and Romania; German Troisdorf powder;
- Sweden: Apyrite powder;
- Switzerland: powder with cylindrical grains with fulmicotton base, invented by MM. Schueker and Amsler sons;
- Etc.

PAUL VIELLE

Engineer and chemist, Paul Marie Eugene Vieille was born in Paris on September 2, 1854 and died in the capital on January 13, 1934. A polytechnic, he opted for the military corps of powder engineers. In 1884, he invented smokeless powder which is a considerable advance in the domain of armaments and which makes France one step ahead of other nations. In 1904, he is named engineer general of powders and director of the Laboratoire central des poudres et salpetres. He was elected member of the Academie des sciences and he is also a professor at the Ecole polytechnique. His works were crowned with the highest awards: Montyon prize, Leconte prize, grand-croix of the Legion d'honneur.

PHOTO

Paul Vieille (1854-1934), inventor of smokeless powder. (Jean Huon's Archives)

The manufacture of cartridges

The cases

Cases are made by successive stretching of a disk of 67/33 brass and then shaping:

- Cutting of a blank that is 23 mm in diameter;
- Two stampings;
- Three stretches;
- Cutting;
- Creation of the primer pocket;
- Two stretches for the rim;
- A first crimping of the neck;

- A second crimp of the neck and marking;
- Turning of the rim and lengthening (or cutting);
- Drilling of vent holes;
- Calibration of the neck.

Photos

Hydraulic press for powders (Jean Huon's archives)

French BF powder (copyright Jean Huon)

German powder (copyright Jean Huon)

Italian solenite powder (copyright Jean Huon)

Swiss powder (copyright Jean Huon)

Belgian powder (copyright Jean Huon)

English cordite powder (copyright Jean Huon)

Photo

Stages in manufacture of the mle. 1886 8 mm cartridge (case and Balle M). (Photo Philippe Regenstreif)

These operations alternate with annealing, washing, cleaning, and checking.

Primers

Primers and primer-covers were produced by the Ecole de Pyrotechnie de Bourges and the Atelier de Construction de Tarbes. The capsule is in copper and the primer-cover is in brass.

Bullets

The balle M was made with a core of compressed lead, alloyed with 5% antimony. The envelope is obtained from a nickel silver blank shaped by stretching:

- Cutting a out a piece;
- Four stretches;
- Cutting;
- Shaping;
- Compression of the core in the envelope;
- Crimping;
- Finishing.

The balle D was stamped in one piece from a 90/10 brass billet. Its fabrication necessitates three operations to shape it (one to give it an ogive and two compressions) and two operations to turn it (cutting off the collar and formation of the groove).

Wads

Wads are composed of a disc of glossy cardboard topped with a beeswax disc.

Loading of cartridges

Priming of the case. Introduction of the powder charge. Putting the wad in place. Putting the bullet in place and crimping.

PHOTO

Stages of manufacture of the balle D (Photo Philippe Regenstreif).

Verifications

In addition to the checks and verifications carried out throughout manufacture, commissions installed near the local cartridge factories are responsible for the receipt of cartridge lots. They are presided over by a colonel or lieutenant-colonel of the artillery, the chief of an artillery squadron or infantry battalion and a certain number of captains and lieutenants of the infantry and the artillery. The cases are presented in lots of 19,600, from which 110 examples are taken which are the subject of a thorough examination during manufacture (external examination, dimensions, excessive fire). The bullets are also presented in lots of 19,600, from which 100 examples ae taken which are the object of a visual, dimensional, and fire exam. In each lot of 19,200 finished cartridges, 152 specimens are collected which undergo:

- An exterior exam and verification of dimensions;
- Disassembly and examination of the components;
- Test fire;
- Velocity;
- Proofs of sealing (immersion in water for 15 days of cartridges in the packet), which must not, after this test, be split at the neck, nor have allowed water to penetrate.

A number of verification tools are made available to controllers and military armorers, among which, we have observed:

Cartridge length checker

It is the Mle. 1907, destined for the Mle. 1886 D cartridge. It permits control of the maximum length of the case and the thickness of the rim.

Photos

Checker of the minimum and maximum length, for the Mle. 1932 N cartridge with SF primer. (Copyright Jean Huon).

Mle. 1902 checker of cartridge length, for the Mle. 1886 D cartridge. (Copyright Jean Huon).

Concentricity checker

Device destined to verify the perfect concentricity of the balle D, both at the ogive of the tip and at the base. Made by the Ateliers de Puteaux in 1917, it gives results to 1/100 of a millimeter on the radius.

Primer checker

The diameter of the Modele 1932 N primer must be between 6.35 mm and 6.40 mm. The minimum height is 2.50 mm and the maximum height is 2.75 mm.

Anvil checker

Gauge to control the protrusion of the anvil of the Mle. 1932 N cartridge case compared to the base: minimum 1.35 mm and maximum 2.2 mm.

Profile checker

Gauge to verify the profile of the Mle. 1932 N bullet.

Photos

Concentricity checker (Copyright Jean Huon).

Primer checker (Copyright Jean Huon).

Anvil checker (Copyright Jean Huon).

Checker of the profile of the Mle. 1932 N bullet (Copyright Jean Huon).

Neck bottom checker

Gauge that controls the minimum and maximum dimensions of the diameter of the bottom of the case neck of the Mle. 1932 N bullet. The diameter should be between 7.67 and 7.82 mm.

Device for determining the center of gravity of projectiles

It consists of a steel plate, a bronze bracket and a mobile cradle receives the projectile. We place the base of the bullet on a U shaped support that is adjustable in height, while the body rests on a fixed fulcrum. The projectile is moved under the action of a screw with a pitch of 100 actuated by a wheel, the latter is graduated in 100 divisions, while the mobile cradle is provided with a corresponding mark on a graduated scale. The scale is graduated in millimeters, while one revolution of the wheel corresponds to one millimeter.

Photos

Checker of the bottom of the case neck of the Mle. 1932 N bullet. (Copyright Jean Huon)

Device for determining the center of gravity of projectiles. (Copyright Jean Huon)

The center of gravity of the balle D is found at 15.59 mm from the base. (Copyright Jean Huon)

We push the bullet lightly with the wheel until it tilts, we can then read the distance between the base and the center of gravity, in millimeters by reading on the scale, while the 100ths of millimeters are read on the graduations of the wheel.

On the bronze support reads the marking **C.E.I. 1926** (Commission d'Experience de l'Infanterie).

Calibration safety device

Permits verification that no cartridge exceeds the maximum dimensions provided for on the construction tables.

Vent hole checker

Device permitting checking if the vent holes are of the right diameter and fully open.

Photos

A cartridge factory in 1939. (Jean Huon's archives)

Vent hole checker. (Copyright Jean Huon)

Aging

The cartridges received by local commissions are verified each month by the commission d'Experiences de Versailles and by the Ecole Normale de Tir. Samples are collected and sent to both facilities for testing as deemed necessary (velocity, accuracy, etc.). If the results are poor, the lot is not accepted for entrance into war provisions for the Infantry. Each year, other checks take place on the lots of ammunition for verification of their aging, that of their packaging; also of their performance.

Photo

Packet of 8 Mle. 1886 D cartridges. (Photo Jean-Francois Legendre)

Placement in packets

Packaging

After manufacture, the cartridges were first packaged by groups of six; then, from 1888, by eight, head-to-tail, in a rectangle of tar paper glazed in a light brown color. The paper is cut to shape on a template. It is closed by a hemp or flax twine ligature, white, regular and dry. Its diameter is 1 mm. From 1917, it became more difficult to find twine. The manufacturing facilities were then allowed to glue the packets.

Stamping

The packets are marked with a pedal-operated stamping machine with steel letters, leaving bold characters. From June 21, 1887, we frame the vignette with two red bands. Depending on the case, the indications marked on the packets are printed with inks of different colors:

- Upper frame, marked in red if the cartridges are destined for machine-rifles and machine guns or to the machine guns;
- Upper frame marked in blue if the cartridges are destined to the rifles, carbines, or musketoons;
- Middle frame marked in blue, with indication of its nature, of its provenance, of the quarter and of the year of manufacture of the cases; also the provenance of the bullets and their type, the number and year of manufacture of the powder lot;
- Middle frame marked in red, if the powder used for loading is American;
- Lower frame marked in blew, workshop, day, month and year of the loading of the cartridges; number and model of the cartridges contained in the packet; number of the lot in the annual series.

Some exceptions to these rules exist.

Case

A gathering of eight packets constitutes a case. This is made of a paper of the same nature as the packets, it has a ligature in the middle of a twine 1.5 mm in diameter. The case receives a stamping similar to the packets contained inside.

Crate

The packets or the cases are packed in wood crates: white crate No. 3 mle. 1877, then Mle. 1906, fitted with an internal zinc envelope. It contains 30 cases of 8 packets, or 1,920 cartridges, loaded it weighs around 70 kg. It measures 0.686 m x 0.270 m x 0.250 m. There also exists a No. 4 white crate, which is reserved for revolver cartridges. There is also a No. 5 white crate for the mountains, with or without interior zinc case, 0.633 m x 0.196 x 0.167 m. Capacity seven cases, weighing 35 kg. The No. 6 mle. 1908 white crate is assigned for transport for munitions placed in bands for the Puteaux or Hotchkiss machine guns. Cartridges without a bullet are transported in a white crate with dimensions 0.480 m x 0.405 m x 0.395 m. The cartridges destined for the colonies can be placed in tin brazed brass boxes (Mle. 1909 watertight metallic boxes):

- Mle. T white crate;
- C 1 crate;
- C 1 bis crate;
- C 2 crate.

We can still find in service in the infantry, at the start of the 20th century, Mle. 1840 infantry munition boxes and in the cavalry and the artillery, Mle. 1858 munition boxes, both lightened and unlightened.

Photo

Case of 64 mle. 1932 N cartridges. (Copyright Jean Huon)

In the mountain troops:

- Company car munitions boxes;
- Light caisson box for infantry munitions;
- Mountain mle. 1862 munitions crate.

For military transport during maneuvers or in times of war, the cases are placed in the boxes which are carried in a caisson, or by campaign cars, where they are fixed permanently; or by pack mules in the alpine troops. The light caisson box for infantry munitions receives 200 cases, or 12,800 cartridges that weigh 430 kg. The mountain munitions box receives 23 cases, or 1,472 cartridges which weigh 57 kg. Each box in a company car receives 128 cases or 8,192 cartridges.

Photo

No. 3 Mle. 1877 white crate. The name of the white crate comes from the color of the wood utilized for their manufacture: fir or poplar. (Copyright Jean Huon)

Loading into clips

Clips loaded with cartridges are packaged two by two in cardboard boxes where they are placed head to tail. The box is fitted with a lid in turn fitted with a wire tape. A paper envelope is glued to all of them. The loaded box of clips weighs 210 g. Stamping of packaging of cartridges in clips is done in similar conditions to those of cartridges in packets. The boxes receive an inscription analogous to that of the packets but indicate that the cartridges are packaged in clips. The boxes are kept in cases of six whose weight is 1.280 kg. They are encased in the No. 3 mle. 1877 white crate, with interior zinc case. The cases are placed in two layers, the middle case of each layer receives a draw string. The crate contains 30 cases of 6 boxes, or 1,080 cartridges in clips, loaded, it weighs about 50 kg. Ultimately, we modify the loading, the cartridges are packaged:

- Either by 10 (2 clips of 5), in a blue paper rectangle;
- Or by 12 (4 chargers of 3) in a tar paper rectangle.

The clips

The supply of arms of the Berthier system necessitates the use of charger-clips in sheet steel of 0.4 mm in thickness. At the start, they receive a zinc-plated or oiled finish, rapidly replaced by a blue.

Mle. 1890 clip

It is a small sheet steel container containing three cartridges. We can distinguish:

- Their two sides and their rounded edges that maintain the cartridges;
- The posterior grooves which form the housing of the rim of the cartridge;
- The anterior grooves which forbid the cartridge from moving laterally;
- The two circular holes which lighten the clip;
- The flat bottom, provided with a protrusion for locking in the rifle.

The clip is symmetrical relative to the middle cartridge and can therefore be loaded in either direction interchangeably. The clips of the first type have a rectangular back.. On the second type clip, two cuts exist in a half-moon permitting observation of the primers. If the clip has one or more crosses marked on the claw of the notch on the second-type clip, this is because it has been refitted as many times as there are crosses. If there is an X on the lips, the charger is reserved for blank or inert cartridges.

Mle. 1916 (1st type) clip

With the placement in service of the five-shot Mle. 1916 rifles and musketoons, we introduce a new clip that receives the same number of cartridges.

Photos

Three-shot charger clip for Berthier mle. 1890 carbines, Mle. 1892 musketoons, Mle. 1902, 1907, and 1907-15 rifles. (Copyright Jean Huon).

Rear of the Mle. 1890 charger

- *1st rectangular type*
- *2nd type with cuts*
- *2nd type reworked once*

(Photo Yves Eteviant).

Photos

First-type five shot clip for Mle. 1916 rifles and musketoons. (Copyright Jean Huon).

Second-type five-shot clip for Mle. 1916 Berthier arms. (Copyright Jean Huon).

Eight-shot clip for experimental Mle. 1918 Ribeyrolle submachine gun (reproduction). (Copyright Jean Huon).

20-shot magazine for Chauchat machine-rifle. (Copyright Jean Huon).

This one is wider, its back forms a broken line with two clip points to permit reversibility. The lateral cutouts are ovals. The posterior grooves are straight. The anterior grooves are lightly curved.

2nd type Mle. 1916 clip

On this variant, the anterior grooves are formed of three stamped sections. The mle. 1916 clips are usable with the Mle. 1916 rifles and musketoons and the Mle. 1918 semi-automatic rifle. The three-shot clip, however, still remains usable with these arms.

Mle. 1917 clip

This model has a flat back, with large lateral cutouts, and is destined for the Mle. 1917 semi-automatic rifle.

Ribeyrolle clip

Special clip with eight shots destined for the experimental Ribeyrolle 1918 submachine gun.

Chauchat magazine

Semi-circular magazine with 20 shots, destined for the Mle. 1915 machine-rifle.

Bands and links

Bands and links for 8 mm Lebel cartridges are described in our work on *LES MITRAILLEUSES FRANCAISES,* from the same publisher (2014).

Photos

Packet of two three-shot clips. (Photo Philippe Mention).

Five-shot clip for Mle. 1917 semi-automatic rifle. (Copyright Jean Huon).

Packet of two clips of 5 Mle. 1886 D (a.m.) cartridges with ordinary bullets for Mle. 1917 semi-automatic rifle. (Photo Philippe Regenstreif).

Production

Despite particularly intense production during the First World War, the production of French cartridges never suffered loosening of tolerances in the manufactures relative to the quality of product. The same rigorous methods of control were applied even in times of peace.

8 mm Lebel cartridges with ordinary bullets

Mle. 1886 cartridge with ordinary bullet

Following ministerial instructions for the rapid development of a new infantry rifle in a very short time, its designers had no other recourse than to adapt already existing equipment. Thus, for the ammunition, if the caliber retained was to be 8 mm, we would make a case compatible with the Kropatschek mechanism, while retaining the base cartridge of the Gras rifle. This case with base and flat rim possesses a body which takes the form of a double truncated cone, this is surmounted via a neck provided with a crimp. This case is made of 67/33 brass, by successive stretches. The primed case weighs around 12 g. The primer is located in a housing with an anvil and two vent holes. The primer, called reinforced, is a copper capsule containing 0.03 g of fulminant composition (2/3 of mercury fulminant and 1/3 of saltpeter), covered with shellac varnish. The primer is placed in a brass primer-cover which keeps it in its housing. This arrangement requires a powerful firing pin strike, thus ensuring that accidental discharges occur – only France and Austria use this system, the other powers use a primer directly crimped into its capsule. Between 1886 and 1890, the primer housing (or shaft) is pressed. The cartridge base is marked **ART.** The charge is composed of 2.70 g of BF powder. A wad formed from a pure yellow wax disc is 2 mm thick and a thin glossy cardboard washer 0.7 mm thick separates the powder from the bullet. The cylindro-ogival bullet has, at its base, 4 mm meplat with sharp edges, which contains a hardened lead core with 5% antimony. It is placed in a nickel-silver envelope, an alloy formed of 55% copper, 20% nickel, 17% zinc and 8% tin. It was developed by two metallurgists named Maillot and Chorier. Its mass if 15 g and its length is around 30.5 mm (in reality from 30.4 to 31.3 mm). The bullet received, from 1887, on the meplat of the envelope, as hollow punches, the mark of the provenance of the nickel-silver used in its manufacture. On the rim, embossed, is the mark of the workshop of production. Its muzzle velocity is around 638 m/s. Above a muzzle velocity of 750 m/s, ruptures of the envelope are observed. After manufacture and tests, the cartridges are packaged and cased (see above, paragraph *Packaging).* In order to correct teething issues, the Mle. 1886 cartridge will undergo some modifications:

Photo

BF powder. (Copyright Jean Huon).

- The mark of the provider of the nickel-steel features on the meplat of the bullet;
- Since the month of February 1888, the charge is composed of 2.80 g of BF powder of a new type called BF-NT, created to remove the coal dust that significantly increased pressure;
- From December 12, 1888, the rim of the case is domed, in order to prevent gas leakage through the primer-cover seal;
- The method of packaging the cartridges is modified from January 1, 1889;
- The path of the bullet is slightly rectified from March 17, 1890, the meplat is reduced to 2.9 mm and it now has a rounded edge;
- We adopt a new primer called *double primer*, the 3rd of September 1890, it is charged with 0.04 g of a mixture of mercury fulminant, saltpeter, and antimony sulfate, with a deeper capsule and primer-cover; in consequence, the protrusion of the anvil is reduced in the primer housing. A powder layer of tin or lead alloy 0.03 mm thick covers the fulminant composition; it is kept by a shellac varnish. The powder receives the addition of amyl alcohol and becomes BF-AM;
- Also in 1890, the separation of the primer vent holes goes from 4.30 to 4.40 mm.

The rim of the case is separated into four sections where we inscribe:

- At the top, the letters **ART,**
- On the left, the number of the quarter of fabrication,
- On the right, the year of production,
- On the bottom, the initials of the manufacturer.

Characteristics

Diameter of the bullet 8.17 mm

Diameter of the case at the neck 8.83 mm

Diameter of the case at the base 13.76 mm

Diameter of the case at the rim 15.99 mm

Length of the case 50.7 mm

Total length 74.9 mm

Weight 29.75 g

Photos

Simple marking of the rim of the cartridge without mention of ART (Copyright Jean Huon).

Cross section of the Mle. 1886 cartridge with ordinary bullet (Jean Huon's archives).

Photo:

Blueprint of the Mle. 1886, 1886 M, and variant cartridges. (Jean Huon's archives).

Mle. 1886 M cartridge with ordinary bullet

In 1891, a light crimp groove is placed into the envelope of the bullet around 6 mm from the base, the interior diameter of the neck goes from 8.08 mm to 8.15 mm. To remedy a problem with rupturing of the base of the case, the internal profile of the latter is reinforced. Its capacity is slightly reduced and the powder charge is lessened to 2.75 g. The primer pocket is no longer stamped but drilled out, this operation is also called disgorging. The cases thus modified are marked **ART M** (Artillerie Modifie) on the rim instead of **ART**. The markings on the packets were modified in the same way. Another modification takes place in 1895: the neck crimp is maintained at the level of the inner section, but the outer profile is cylindrical, which strengthens this element. Subsequently, the packaging is slightly modified. In 1899, the insulating tape is removed and the ligature is modified, we fix a seal; the information is printed in black. In 1906, the seal is removed and the ligature undergoes a new change.

Photos

Mle. 1886 M cartridge with ordinary bullet loaded at Valence in 1897. (Copyright Jean Huon).

Spitzer balle M cartridge. (Photo Yves Etievant).

Markings on the meplat of balle M bullets (Copyright Jean Huon).:

- *Without marking*
- *Metal provided by the Atelier de laminage de Bourges.*
- *Metal provided by the Trefileries et Laminoirs du Havre a Rugles.*

Markings on the base of balle M bullets:

- *Atelier de Construction de Douai.*
- *Atelier de Construction de Rennes.*
- *Societe Francaise des Munitions.*

(Copyright Jean Huon).

Mle. 1886 D cartridge with ordinary bullet

In 1894, Captain Desaleux undertook research to improve the performance of the 8 mm cartridge. After testing with low-necked projectiles, he confides in the Atelier de Puteaux the creation of five types of bullets in die-cast brass, with different lengths and masses, designated balle A, B, C, D, and E. These projectiles have one commonality – a bi-ogival profile, with a point at one end and truncation at the other. These give rise to sub-variants, it is the balle D that is retained in light of its remarkable performance in terms of speed, accuracy, and trajectory. The definitive choice is between the variants in drawings No. 66 and No. 139. Adopted in 1898, the Mle. 1886 cartridge with balle D (drawing No. 139) is made according to the blueprints of April 23, 1901. Its particularly flat trajectory necessitated modification to sights then in use on service armaments. We also publish holdover tables permitting the use of Mle. 1886 D or 1886 M cartridges in arms whose rear sights do not correspond to them. This practice came to an end with the exhaustion of the stocks of Mle. 1886 M cartridge stocks. The Mle. 1886 D cartridges utilize a case whose interior surface of the neck is perfectly cylindrical, the entrance of the neck possesses a more important chamfer and its thickness goes from 0.31 to 0.33 mm. The length of the case goes from 50.7 to 50.4 mm. The primer pocket is still created by drilling, we create a circular groove of 0.5 mm in depth around the primer housing. The primer is still the Mle. 1890. The primer-cover is in hardened brass. Following the addition of the groove, markings are reduced, although now including mention of **ART D.** The first lots have dates of 1900 or 1901. The charge is composed of 2.95 to 3 grams of BN-3F powder to which is ultimately substituted with BFP1 or B.Pa.0,3 powders.

Photos

Packet of cartridges of Mle. 1886 M cartridges with ordinary bullets made at Valence in 1897. (Photo Yves Etievant).

Packet of cartridges with ordinary bullets produced at Vincennes in 1897. (Copyright Jean Huon).

The pointed bi-ogival Mle. 1898 bullet is in 90/10 brass, from 1905, it is given a crimping groove. It measures 39.2 mm and it weighs 12.8 g. Its muzzle velocity reaches 701 m/s in a rifle barrel. Its maximum range is 4,400 m. The packaging of the first cartridges given this groove are marked *Lot S* (S for serti). The crimping of the case on the ball has to be greater than 15 kg and less than 60 kg. We also experiment with, at about the same time, a waterproofing varnish at the level of the crimp and in order to prevent the powder from sticking to the base of the bullet, it is equipped with a paper wad! The packaging of these cartridges is marked *Lot SV* (serti et verni). Later, we utilize a thick shellac varnish, fuchsin colored (0.700 kg of shellac per liter of alcohol). The completed cartridge weighs 27.80 g, it does not have a wax wad. A varnish at the neck and a primer varnish ensure its sealing. We return to stamping for the creation of the primer pockets, certain cases produced during a short transition periof (1910-1911) are marked **SD** (sans degorgement) in place of **ART D.** We return to the packaging of the Mle. 1886 cartridge with separate isolating band and script in blue ink. But on December 3, 1906, the isolated band is removed and it is replaced by a prolonged tongue of the enveloping rectangle. We replace the Mle. 1886 ligature with that of the Mle. 1886 M packaging. The 1st of March 1908, the tolerances of the charge are from 2.97 to 3.02 g of powder.

GEORGES RAYMOND DESALEUX

Born in 1851. Old student of the Ecole polytechnique, graduating in 1870. He is a ballistician of the first order and is also an excellent shooter. He is promoted to captain in 1877, then squadron chief in 1890. Appointed to the commission d'Experiences de Versailles, we owe to him the cartridge of the Mle. 1886 rifle, then the balle D. Named a colonel in 1902, he was a brigadier general in 1907, then division general in 1912, then we find him president of the commission d'Experiences de Bourges. In 1914, he is named commander of the defensive artillery

and forts of Paris. In 1917 and 1918, he developed long-range explosive shells (11 km) for the 75 mm cannon. He also participates in the adoption of the Mle. 1932 N bullet. General Desaleux was a recipient of the Legion d'honneur.

Photos

General Desaleux. (Jean Huon's Archives).

Mle. 1886 (a.m.) Balle D cartridge

The placement in service of machine guns revealed imperfections which concerned the primers of the Mle. 1886 D cartridges. We then made a cartridge provided with a case that received a reinforced primer. This is kept in place by a large circular groove or listel. This device also allowed bringing the bullet tip that is behind the preceding cartridge into the magazine of the Lebel rifle, out of range of the primer. After a trial of *1911 rimmed cartridges* (or *STA rim*), we place in service in 1912 the *Mle. 1886 D (a.m.) cartridge* (amorcage modifie).The primer and its primer-cover are larger and crimped by the listel. On the cases of the 1st type, these have sharp angles. The primer-cover is modified in 1914 and the joint of the primer-cover with the case is replaced with shellac varnish. From 1915, the listel with sharp angles is replaced by a listel with rounded edges. The markings also undergo a modification, we abandon the sectors and the mention of **ART**; the rim carries the year and quarter of manufacture, the manufacturer's code and that of the provider of the metal of the case. The fact that we commissioned two types of cartridges (one for repeating arms and another for automatic arms) complicates the supply of the Mle. 1886 D (a.m.) cartridge, albeit it did gradually assert itself as the only type of standard ordinary bullet used during the First World War. We made 6,812,894,087 examples of it during the conflict. The charge is made of around 3 g of BN-3F powder, the total length of the cartridge is 75 mm and its mass is around 27.5 g. During the conflict, certain cartridges could have been loaded with English or American powder. Only the package label permits identifying this particularity. In 1920, the tin primer material is replaced by a paper material. From 1924, certain cartridge manufactures (Le Mans, Le Havrem S.F.M.) make cartridges receiving a Mle. 1924 A primer, common with 7.5 mm Mle. 1924 cartridges and later the Mle. 1929. It is loaded with 3.6 g of fulminant composition covered with varnish material flakes. The capsule is in brass. The cases therefore manufactured are designated Mle. 1886 (a24). From around 1927, the Societe Francaises des Munitions – and them alone – loads cases with its own primers. These are designated Mle. 1886 (sf). The Mle. 1886 cartridges loaded with balle D were designated *8 mm Patrone sS 304/1 (f)* in the nomenclature of captured and reused munitions by the German army between 1940 and 1945. Certain munitions may have been subjected to special processing at the manufacturing or packaging level, which is indicated on the labels:

- Warm countries (charge lightly reduced);
- Precision lot;
- Cartridge with pointed bullets (crimping reinforced for machine guns);
- Munitions for airplanes (selected for their quality of constant manufacture);
- Reloaded, reserved for training.

Trials with balle D (Emeric Daniau archives).

Mle. 1886 D (a.m.) cartridge with ordinary bullet (Copyright Jean Huon).

Markings on the base of balle D (Copyright Jean Huon):

- *Atelier de Construction de Tarbes, metal furnished by A. Gramont a Pont-de-Cheruy, 2nd quarter 1910.*
- *Atelier de Construction de Vincennes, metal furnished by the Compagnie du Duralumin et du Cuivre a Boisthorel (Orne), 2nd quarter 1912.*
- *Atelier de Construction de Toulouse, metal furnished by the Compagnie francaise des metaux a Castelsarrasin, 4th quarter 1937.*

Photos:

Drawing of the balle D (Jean Huon's archives).

BN3F powder (Copyright Jean Huon).

Crimped and varnished balle D cartridge with wad (Photo Yves Etievant).

Photos:

American CR.257.15 powder which were used to charge Mle. 1886 D a.m. cartridges, loaded with 2.58 g. (Copyright Jean Huon).

Evolution of the mle. 1886 cartridge (Photo Yves Etievant).

Cartridge packets for the ordinary bullet Mle. 1886 D cartridge (Photos Philippe Regenstreif & Jean-Francois Legendre):

- *Made in Toulouse in 1910*
- *Loads for machine-rifles and machine guns (reinforced crimping)*
- *Made in Toulouse in 1917.*
- *Made in Rennes in 1940.*

Photos

Packaging of cartridges loaded with American powder. *Pierre Coline.*

Packet of Mle. 1886 D (a24), with Mle. 1924 A primers, made at Mans in 1930. (Photo Yves Etievant)

Packet of Mle. 1886 D (sf), with S.F.M. primers, made in 1927. (Photo Yves Etievant).

Packet of Mle. 1886 D (a.m.) cartridges for warm countries, made at Tarbes in 1939. (Photo Yves Etievant).

Cartridge with Mle. 1917 SFM bullet

Essentially kept to the machine guns, this cartridge is produced by the Societe Francaise des Munitions, in its Issy-les-Moulineaux factory, close to Paris. The pointed ogival bullet measures 32 mm and weighs 12.6 g, and contains a lead core and a cupronickel alloy jacket. It is charged with 3.15 g of BN-3F powder and is characterized by a velocity of 720 m/s.

Photo

Packet and ordinary bullet cartridge Mle. 1917 made by the S.F.M. (Photo Jean-Francois Legendre).

Photos

Balle D spitzer cartridge (Photo Yves Etievant).

Box of verification tools for the Mle. 1917 balle cartridge. (Photo Yves Etievant).

Packet of cartridges for the Mle. 1923 C with ordinary bullets with cases made at Vincennes and loaded at Tarbes in 1929. (Photo Philippe Regenstreif).

Stamp on the interior of the box of verification tools (Photo Yves Etievant).

Mle. 1923 C balle cartridge

Variant of the preceding model. Its jacket is in steel plated with cupronickel and the projectile contains a crimping groove. Length 31.5 mm, weight 12.8 g. This cartridge was produced in the arsenals under the name Mle. 1886 C.

Mle. 1932 N cartridge with heavy bullet

In 1932, we put in service a cartridge whose ballistics are equivalent to (and even slightly superior) that of the balle D. This *Mle. 1932 N* bullet is developed by General Desaleux. About thirty experimental models – at least – were created. In the end, it was the one designated N 17 that was retained. The form of the projectile is equivalent to that of the balle D, but it is made with a hardened lead core with 3% antimony and a jacket of soft steel plated in maillechort (or cupronickel), with a crimping groove at 24.5 mm from the tip. Its length is from 39.05 to 39.75 mm and its mass is 15.05 g. Its base is concave. The diameter of the projectile above the crimp is between 8.22 and 8.27 mm. It is 8.32 mm at the base. This bullet has the particularity of being less erosive than the balle D, which augments the length of the life of the barrels in Hotchkiss machine guns. The Mle. 1890 primer receives an Mle. 1932 reinforced monobloc primer-cover, which is lightly modified in 1936. The charge is composed of BFP1 powder. The brass case is the same as the Mle. 1886 D a.m. The Mle. 1932 N cartridge with ordinary bullet was also made for the German Army under the Occupation:

- By the Atelier de Construction at Tarbes, with brass cases or in phosphated steel (marked **TS** or **oyj**);
- By the Atelier de Construction at Toulouse, with brass cases or in phosphated steel (marking **TE** or **pas**).

The Mle. 1932 N cartridge possessed a slightly stronger neck than those of the other munitions. The primer is made of one piece from 1936. This cartridge can only be fired in rifles and musketoons with reinforced firing pin springs and in arms whose chamber was modified, these carry the letter N struck on the barrel and on top or on the side of the chamber area. This modification was performed on the Saint-Etienne 1907 T machine gun from April 4, 1936; thereafter – in principle - on all arms in 8 mm Lebel still in service or in stockpiles at depots. This included all Mle. 1886-93 Lebel rifles and Mle. 1886-93 R 35 musketoons, the Berthier carbines, musketoons, and rifles, single-shot Mle. 1874-80 M 14 rifles, but not the Remington *Rolling-Block.* The muzzle velocity is 690 m/s and in indirect fire using the Hotchkiss machine gun, its effective range is 4,600 m. This cartridge was designated *8 mm Patrone sS 304/2 (f)* in the German Army between 1940 and 1945.

Photos

Mle. 1923 C cartridge with ordinary bullet (Copyright Jean Huon).

Mle. 1932 N cartridge with ordinary bullet (Copyright Jean Huon).

Photo

Drawing of the ATS load for Mle. 1932 N bullet cartridges. (Philippe Regenstreif).

Mle. 1932 N cartridge made for the occupation

The Mle. 1932 N cartridge with ordinary bullet was also made for the German Army under occupation:

- By the Atelier de Construction at Tarbes, with cases in brass or in phosphated steel (marked **TS** or **oyj**);
- By the Atelier de Construction at Toulouse, with cases in brass or in phosphated steel (marked **TE** or **pas**).

The Germans had to pay a fee to the cartridge factories for the utilization of the patent relating to the manufacture of steel cases that they had ordered themselves! There can be some anomalies in markings, with notably brass cases marked **St,** markings signifying *Stal* (steel in German) and reserved in principle for steel cases.

Mle. 1886 N cartridge with heavy Mle. 1932 N bullet

Produced after the Second World War, this is a variant of the previous with an Mle. 1886 N case, an Mle. 1932 primer, and a B.Pa.0,3 powder charge. The bullet is of the Mle. 1932 N pattern, whose core is of antimony-

lead alloy and jacketed, either in an envelope of maillechort plated steel, or in an envelop of bonderized and lacquered soft steel, or only lacquered. Its mass is 15.10 g. The blueprints of the 8 mm Lebel Mle. 1886 N cartridge with 1932 N bullet are modified again on January 25, 1952, replacing those of April 23, 1947. The last production runs are:

- 1950 for the Army (last lot known as TE 3-50);
- 1962 for the Republic of South Vietnam (Gevelot);
- 1964 for the CRS (Gevelot), but it may be a late repackaging.

Photos

BFP1 powder (Copyright Jean Huon).

Mle. 1932 N cartridge with ordinary bullet with steel case manufacture for the occupation (Copyright Jean Huon).

Phases of manufacture of the Mle. 1932 N bullet. (Copyright Jean Huon).

Rim of an Mle. 1886 N cartridge with ordinary bullet made by the Leon Paulet cartridge factory at Marseille in 1949. (Copyright Jean Huon).

Mle. 1886 N cartridge with ordinary bullet made by the Leon Paulet cartridge factory at Marseille in 1949 (Copyright Jean Huon).

Photos

Rims of the Mle. 1932 N cartridge with ordinary bullet produced under the Occupation (copyright Jean Huon):

- *Steel marked oyj and St (made at Tarbes);*
- *Brass case marked oyj and St (made at Tarbes);*
- *Steel case marked TE and St (made at Toulouse).*

Packet of Mle. 1932 N cartridges with ordinary bullets loaded in 1940 (Photo Philippe Mention).

Packet of Mle. 1932 N cartridges with ordinary bullets made at Tarbes with coded label (Photo Philippe Regenstreif).

Packet of Mle. 1932 N cartridges with ordinary bullets made at Toulouse with clear label (Photo Philippe Regenstreif).

Packet of Mle. 1886 N cartridges made by S.F.M. in 1948 (Photo Philippe Mention).

Cartridges with tracer bullets

Mle. 1886 T cartridge with tracer bullet

It was conceived by the Squadron Chief Desvignes at the Ecole centrale de pyrotechnique at Bourges. It contains an Mle. 1886 D (a.m.) brass case, an Mle. 1890 primer and an Mle. 1914 primer-cover, and a 3 gram charge of BFP1 powder. The tracer bullet presents the same exterior profile as the Mle. 1898 balle D, its base possess an internal hollow. The first models contain a relatively deep hollow, but this rendered the bullet too light and too instable. These experimental projectiles never receive a particular identifier. Then, we created tracer bullets, always from the balle D, but with a hollow 6 mm in diameter and 10 mm deep to receive a tracer compound and an illuminating compound, kept by a rimmed brass ring inserted in the rear groove of the bullet. The tracer compound is made of a mix of minium and a magnesium powder giving it a white color. A second model, created by the Atelier de Toulouse, was loaded with a tracer composition with a magnesium base and strontium nitrate. It produced a red color. The mass of the projectile is 11.20 g, the muzzle velocity is 750 m/s and the tracer path is visible up to

600 meters. We can identify them thanks to the tinning on the surface of the bullet. The 8 mm T cartridges are packaged in groups of 50, in tinplate boxed or in corrugated board.

Cartridge with Delvigne tracer bullet, with long left side drilled out (experimental), and on the right, the short cut out (Mle. 1886 T). (Copyright Jean Huon).

Mle. 1886 T tracer cartridge. (Copyright Jean Huon).

Box of tracer bullets in the 8 mm Mle. 1886 T configuration of the definitive model (depth of the well 10 mm). (Photo Philippe Regenstreif).

The Mle. 1886 T tracer cartridge seems to have only been produced at Toulouse. Cartridges destined for aviation use were the subject of particularly careful manufacture. On November 1, 1918, a team of 13 people made 7,000 tracer projectiles in 10 hours of work. Three teams worked in turn. This cartridge was designated *8 mm Patrone S.m. l'spur 303 (f)* in the German Army between 1940 and 1945. It was also made for the occupation with brass cases marked **oyj** (Atelier de Construction de Tarbes) or **pas** (Atelier de Construction de Toulouse).

Mle. 1886 N cartridge with Mle. 1951 tracer bullet

The profile of this cartridge is similar to that of the balle 1932 N, with a meplat at the summit of the ogive. It is made with a lead core and a jacket of cupronickel-plated steel or bonderized and lacquered steel or only lacquered. It contains at the rear a brass or steel well which contains a tracer compound or an ignition compound: the well is then flared to facilitate its attachment under the edge of the jacket. It measures 39.3 mm and its mass is 15.05 g. We can identify it by its tip painted in white for about 5 mm or in red for about 8 mm. Focused on at the end of the 1940s, this cartridge was never put into series production because it appeared at the moment where we stopped the production of 8 mm Lebel cartridges.

Photos:

Mle. 1951 tracer cartridge (Photo Yves Etievant).

Label of box of balle Desvignes cartridges. (Jean Huon's archives).

Cartridges with penetrating bullets

Cartridge with Poignon penetrating bullet

Cartridge with exposed steel core at the tip, it exists in many forms. This cartridge was produced during the course of the 1st quarter of 1915 and we only find it with first type Mle. 1886 D (a.m.) cases.

Cartridge with three-groove penetrating bullet

This is an experimental cartridge and it is also feasible that there was also a two-groove penetrating bullet, the presence of these probably being used as an identifier during trials. These projectiles are also used in first type Mle. 1886 D (a.m.) cases, but dated to the 2nd or 3rd quarter of 1915.

Cartridge with Mle. 1886 P penetrating bullet

This cartridge is composed of an Mle. 1886 D (a.m.) case, with an Mle. 1890 primer and Mle. 1914 primer-cover. The charge is composed of 3.20 g of BNF3 powder (ultimately replaced by BFP1). The projectile, designed by the Atelier de Puteaux and known by the name of APX 4, contains a 4.05 g steel core and a chemically blackened brass jacket and a single crimping groove. It measures 32.5 mm and its mass is 9.60 g. The muzzle velocity of the projectile is 950 m/s and it penetrates 6 mm of steel at 400 m.

The packaging of 8 mm P cartridges is analogous to that of Mle. 1886 D (a.m.) cartridges, but the paper is orange colored.

Its utilization is forbidden in the Mle. 1907 and Mle. 1907 T machine guns. This cartridge was designated ***8 mm Patrone S.m.K. 305 (f)*** in the German Army between 1940 and 1945.

APX 4 bullet

Penetrating bullet with brass jacket and 4.2 g Stub steel core, tempered at 760 degrees C without cooling. The mass of the projectiles is 9.50 g, we identify it via its color, varying in shade from brown to black, obtained via oxidation. The charge is composed of 3.20 g of BN3F *Amelioree* powder. The complete cartridge weighs around 25 g.

7.7 mm bullets of the same type were also manufactured, for equipping the .303 cartridges also used in aviation.

Photos

Cartridges with bimetallic Poignon penetrating bullets. (Photo Yves Etievant).

Cartridge with 3-groove penetrating bullet (Photo Yves Etievant).

Photos

8 mm Mle. 1886 P penetrating cartridge (Copyright Jean Huon).

APX 4 penetrating bullet (Jean Huon's archives).

Packet of Mle. 1886 P penetrating cartridges (Photo Philippe Mention).

Packet of cartridges with penetrating bullets made by the Atelier de Puteaux, reloaded and kept for training. (Photo Philippe Mention).

Cartridges with incendiary bullets

Cartridges with Partiot PH 1 bullet

Projectile in the same form as the Mle. 1886 M, but it is a little longer. Its jacket is in brass and it contains some phosphorus. It is made of 67/33 brass with a central cavity containing a stick of compressed white phosphorus. It is closed at its base by two brass discs, then tin, separated by a varnish layer and forms a cap. A lateral vent is provided below the crimping groove, it is obturated by a Darcet alloy (50% bismuth / 30% lead / 20% tin) which melts at 94 degrees C, a lower temperature than that produced by the friction of the projectile in the barrel.

Cartridge with Partiot PH 2 bullet

It is made of a brass or copper jacket, receiving, from top to bottom: at ogive level, a tempered steel head (called snout), a brass well (called wedging tube) containing the phosphorus, it is obturated by a brass disk, at the base, we find an antimonious lead cap.

Photos

Cartridge with Partiot PH 1 incendiary bullet (Photo Yves Etievant).

Cartridge with Partiot PH 2 incendiary bullet (Photo Yves Etievant).

Drawing of the Partiot PH 2 incendiary bullet (Photo Philippe Regenstreif).

Like for the other model, ignition is carried out by a Darcet alloy sealed vent. Its length is 39 mm. The propulsive charge is constituted of 3 g of BN-3F *Amelioree* powder. The PH 1 and PH 2 bullets possess incendiary properties against airplanes up to 200 meters, this meant that we had to get very close to them!

Cartridge with increased capacity incendiary bullet

Same layout as the PH 2 bullet, but the steel head has disappeared and the well occupies the entire anterior section of the projectile. It is also obturated by a brass disk and a lead plug. Length: 40 mm. (*Source: drawing from the ECP Bourges of July 1918, signed by Captain Partiot, department head)*

Cartridge with Buckingham bullet

There were also 8 mm incendiary projectiles made that were designed like the British 7.7 mm Buckingham bullets. The cylindro-ogival projectile with meplat possesses a tombac jacket. The incendiary charge is placed at the front, with a fluted and free lead block in the center, and at the rear a lead pad.

Photos

Drawing of the incendiary bullet with increased capacity (Photo Philippe Mention).

Cartridge with Buckingham incendiary bullet (Photo Yves Etievant).

Label of a box of incendiary cartridges (Photo Philippe Regenstreif).

Reduced range cartridges

Cartridge with sectioned bullet

After numerous trials with shortened bullets *(see below),* we create a cartridge with sectioned bullet for firing at reduced ranges with rifles and musketoons; they only function in single shots. It receives a balle D whose total length was diminished to around 16.2 mm. This shortening augments by 50 m the muzzle velocity of the projectile. Its maximum range is 2,000 m, which permits the use on ranges which do not permit the use of the balle D. The total length of the cartridge is 58 mm and its mass is around 25 g. The powder charge is 2.56 g. The cartridges with sectioned bullets are placed in grey cardboard packages containing 12 cartridges. These packages are packaged in groups of six in boxes that are also grey cardboard. If one February 14, 1915 instruction is to be believed, the adoption of this munition was performed late and it was justified by necessity, following “local provisions . . . / . . . to lose at some distance from the arm, their deadly power and to thus become harmless to friendly troops”. They were sectioned in the field, with a lathe or a hand saw without unloading the cartridges. With a hand saw, the use of a guiding device was recommended! This cartridge was designated *8 mm Ubungspatrone 308/2 (f)* in the German Army between 1940 and 1945.

Cartridge with milled bullet

After having tested numerous devices of which one is a cartridge with a bullet pierced longitudinally by several channels (see below), we adopt a projectile of the type D of which the ogive contains two machined meplats on either side. Its mass is 12 g. It permits execution with automatic arms training fire on firing ranges that are incompatible with the balle D. The precision of the bullet is excellent at 200 m, good at 400 m, mediocre t 600 m and very bad beyond. The cartridges with milled bullets are packaged by the eight, in chamois colored boxes. The boxes of eight are grouped in eights, for constituting kits, enveloped in chamois colored paper. This cartridge was designated *8 mm Ubungspatrone 308/1 (f)* in the German Army between 1940 and 1945.

Photos

Cartridge with sectioned bullet for rifle or musketoon (Copyright Jean Huon).

Packaging label of cartridges with sectioned bullets made at Tarbes in 1938 (Photo Philippe Regenstreif).

Cartridge with milled bullets for machine guns (Copyright Jean Huon).

Shooting gallery cartridge

We experiment, around 1889, with a reduced range cartridge firing a cylindro-ogival aluminum bullet with a flat head and shouldered guide belt, whose base is hollowed out with a 4.83 mm wide and 16.6 mm deep hole. Its length is 25.51 mm and its mass is 2.25 g. This projectile, obtained by turning on a lathe, was mounted on a chemically blackened case, on which it was set at the next by four needle strikes. It was planned that the fired projectile would be recovered by the target to be reused. An instruction of October 23, 1896 specifies the characteristics of a reduced range cartouche which include:

- An Mle. 1886 M case annealed once and for all on the anterior cone of the case body, excluding the neck and the posterior cone;
- A powder charge of 0.45 grams of J3 powder;
- A wad constituted of a wax disk identical to the wad of the Mle. 1886, contained between two thin cardboard disks;
- A cylindro-ogival bullet, hollow, in aluminum and a weight of around 2.3 grams. This bullet, which presented at the rear a wide 8.15 m/m caliber area destined to be forced in the rifling, is kept in place by a neck crimp. It measures 26 mm in length and possesses a 5 mm diameter and 17.5 mm long hollow.

In addition, the document describes the tooling used for reloading. Later, we experiment with similar projectiles, but stamped whose characteristics are:

Length:	26.28 mm
Weight:	2.76 g
Cavity:	3.80 mm in diameter and 5.67 mm deep.

After a decades-long dearth, this cartridge reappears in the 1920s under the form of a gallery cartridge destined for law enforcement. Its short cylindro-ogival bullet is in cast aluminum. The charge is made of nitrite paper. The bullet measures 6.31 mm long, with a 4.11 mm diameter and 7.82 mm deep hole; its mass is 2.81 g. A military document of 1957 mentions: “This cartridge of which the penetration of the bullet is almost zero (sic) is utilized by the law enforcement agencies in case of protests on public roads.”

Photos

Packet of cartridges with milled bullets made at Tarbes in 1937 (Photo Philippe Mention).

Experimental cartridge with reduced range bullets marked ART / 89 / VIS-H, set at the next by four needle strikes and mounted on a chemically blackened brass case. (Gilles Basso).

Shooting gallery cartridge (Copyright Jean Huon).

Photos

Reduced power cartridge with aluminum bullet (1896) (Copyright Jean Huon according to a document from Philippe Mention).

Gallery and reduced range bullets (Photo Yves Etievant).

Packet of gallery cartridges made at Vincennes in 1937 (Photo Philippe Regenstreif).

Reduced power cartridges and devices

Mle. 1895 reduced power cartridge

It contains a primed Mle. 1886 M case, lightly opened at the neck to add a height of 2 millimeters. The charge is composed of 0.29 g of J3 powder, free in the case, this yellowish brown powder resembles coarse-grained sand. This cartridge is destined for rifles. For carbines and musketoons, this charge is reduced to 0.25 g. The spherical bullet with lead core and copper jacket, of 8.15 to 8.20 mm caliber and weighing around 3 g, goes a little

more than half its diameter into the case and is only kept there by the elasticity of the neck wall. This cartridge is issued by the eight in brown paper packets.

Reduced power cartridge with hollow cylindrical lead bullets

An instruction of January 6, 1898 indicates the way forward for the manufacture and usage of the reduced power cartridge with hollow cylindrical lead bullets for the Mle. 1886 infantry rifle. The reduced power cartridge contains:

- An Mle. 1886 M case with Mle. 1890 primer;
- A 0.25 g charge of J3 powder;
- A wad, constituted of a wax disk, identical to the Mle. 1886 wad, contained between two thin cardboard disks;
- A cylindrical bullet, hollow on the longer part of its length, in hardened lead, with 5% antimony and a weight of around 6 g. This bullet is 8 m/m 10 in diameter and 15 mm long. The ogival hollow opens at the front and is 12 m/m deep.

For the execution of repeating fire, a linden wood buffer, is given a tail of the same form as the hollow of the bullet, which serves to unite the buffer to the bullet at the moment of charging the arm.

Photos

Reduced power Mle. 1895 cartridge (Copyright Jean Huon).

Poudre J (Copyright Jean Huon).

Packet of reduced power Mle. 1895 cartridges (Photo Yves Etievant).

Reduced power Mle. 1898 cartridge (Copyright Jean Huon according to Philippe Mention's document).

The tooling includes:

- A multiple bullet mold, combined with:
- A tray with spines to keep the hollows in the bullets;
- A pin demolder;
- A primer press;
- Four powder throwers with a capacity of 1.25 grams of J3 powder;
- Four funnels;
- A loading hopper with tap;
- Four shellholders;
- A case trimmer;
- A hand milling cutter to give entry to cases.

We will not fail to notice the similarities between this projectile and Bonnet gallery cartridge described below.

Reloadable reduced power cartridge for rifle

According to the instruction of February 18, 1902, it is composed of a primed Mle. 1886 or Mle. 1886 D (a.m.) case, a charge composed of a 42 x 32 mm sheet of nitrite paper, folded in an M for a mass of 0.125 g and a spherical lead bullet 8.45 mm in diameter, weighing around 3.5 g. Its total length is 54 mm. It was initially intended only to be kept in place by its adhesion to the case neck, but, in usage we realized that it sometimes tended to sink too much into the case and we therefore made a groove at the neck level of the cartridge. This cartridge can be fired in **repeating fire**, only in rifles and musketoons. In fire at 15 m, we set the rear sight at 400 m for the rifle and at 200 m for the musketoon. The reduced power bullet has a muzzle velocity of around 250 m/s. At 15 m, it can

penetrate a 3 cm fir board. The penetration at low distances generally does not exceed 6 cm of fir, 3 cm of oak, 25 cm of loose earth and 20 cm of compacted earth. Its maximum range is 400 to 500 m.

Photos

Reloadable reduced power cartridge for the rifle, with its spherical bullet and its nitrite paper charge. (Copyright Jean Huon).

Reloadable reduced power cartridges with crimping groove (Photo Yves Etievant).

Small tooling kit for preparation of cases of reduced power cartridges (Copyright Jean Huon's archives).

Photo

Tools for reloading reduced power cartridges (Copyright Jean Huon's archives).

It is made in the troop corps with fired cases already used for firing a bullet. To this effect, two teams are organized:

- One group of six men charged with depriming, cleaning, and repairing deformed cases;
- **In another room,** the loaded team is constituted of five men: one for opening the case neck, one for priming, two for folding and loading the nitrite paper charge and another for placing the bullet.

The material utilized for the preparation of the cases are placed in a crate containing:

- 1 nut wrench;
- 1 hand milling cutter;
- 2 conical chucks;
- 1 hand crimper;
- 2 hand primers;
- 1 screwdriver;
- 4 100 round capacity shellholders.

In addition, three machines are used:

- 1 set of depriming pliers;
- 1 priming press;
- 1 case trimmer.

A team can make 400 to 500 cartridges per hour. The elements concerning this cartridge were to be withdrawn from supplies following a circulaire of June 26, 1951. It was also mentioned in the regulation that it was necessary to proceed with research into fired bullets, these being unusable for another firing, but that it was appropriate to look for them to donate to the artillery. After each shooting session, it was necessary to remove all the visible projectiles by hand, either in the earth or in the wall coverings. At the end of each week, we proceed with a more complete search by passing the earth through a sieve, the preparation of which is left to the care of each unit; it is a truncated pyramid which in its largest dimensions measures 0.90 m x 0.65 m, its sides are oriented at around a 45 degree angle and the base is lined with a square mesh screen using 1.3 mm wire.

Mle. 1906 stand cartridge

The mle. 1906 stand cartridge is destined to allow shooting organizations to make usage of the Lebel rifle even if they do not have a stand of sufficient dimensions. The Mle. 1886 M bullet possesses an ogive sectioned to a millimeter below the meplat and has a tronconic hollow practically following the axis of the bullet. The charge is composed of 2.75 g of BN powder. Cartridges of this type are found in the barracks of Northern France by the Germans in 1914. They immediately organized a false campaign, accusing the French of having used expanding projectiles in combat. This slander was picked up by the Swiss and American press of the era...

Photo

Mle. 1906 stand cartridge (Copyright Jean Huon).

Mle. 1924 stand cartridge

It possesses a short cylindro-ogival bullet in bare lead. Two variants exist:

- One for fire at 50 m, loaded with 0.50 g of No. 3 J powder;
- The other for fire at 100 m, the charge increases to 0.80 g of the same powder.

Stand cartridge with wadded lead bullet

Cartridge with bullet in the balle M profile, in bare lead, with a paper wad. .

Mle. 1924 stand cartridge (50 m) (Copyright Jean Huon).

Mle. 1924 stand cartridge (100 m) (Copyright Jean Huon).

Stand cartridge in pure lead with paper wad (Photo Yves Etievant).

Stand cartridge with reinforced jacket (Copyright Jean Huon).

Photos

Bonnet reduced power cartridge (1st type) (Copyright Jean Huon).

Rim of a Bonnet reduced power cartridge (Copyright Jean Huon).

Bonnet reduced power cartridge (2nd type with neck shrunk at the base) (Copyright Jean Huon).

Packet of reduced power Bonnet cartridges (Photo Yves Etievant).

Minimum-maximum length checker for the Bonnet reduced power cartridge (1911) (Copyright Jean Huon).

SFM stand cartridge

The SFM proposed to shooting clubs a bullet, called “reinforced jacket”; it is composed of a lead core and a jacket partially in tombac. Its profile is similar to that of the balle M.

Bonnet reduced power cartridge

The projectile is short and cylindrical, it is in bare lead and it is hollow at the front. It was developed by General Bonnet. We know of two variants:

- One with the projectile introduced into the neck;
- The other with a crimp just above the beginning of the taper of the neck.

We used it for fire at 15 to 50 m, it was loaded with a charge of 0.20 g of J No. 3 powder. The rim of the cartridges bore a marking specifying **TIR BONNET *GG*,** but this is not systematic. They are packaged by the ten in a cardboard box.

Gevelot & Gaupillat 1891 reduction tube

Brass tube given two crimping grooves in the neck. It is used with a spherical lead bullet, propelled by a cartridge without a bullet.

8 mm reduction tubes

They exist in several models, permitting the firing of an Mle. 1892 revolver cartridge:

- Model in bronze, 50.5 mm long;
- Steel model 46 mm long;
- Brass model 36.5 mm long.

Steel reduction tube for fire from 20 to 30 m

Turned steel model, first sold commercially under the name of **Systeme PINSON** reduction tube, then without doubt following a sale of the patent as the **Systeme S.F.** reduction tube. It permits fire at a range of 20 to 30 m and receives a spherical lead bullet, propelled by a 22.5 mm long cartridge without a bullet, loaded with J No. 3 powder.

Photos

Box of stand cartridges made by the S.F.M. (Copyright Jean Huon).

Brass GG 1891 reduction tube (Photo Yves Etievant).

Reduction tubes for the fire of the 8 mm Mle. 1892 cartridge (Copyright Jean Huon).

Steel reduction tube for fire at 30 to 50 m

It is practically identical to the preceding and it is also sold commercially under the name of **Systeme S.F.** reduction tube. It receives a short cylindro-conical bullet 15.3 mm long weighing 7 g, it is propelled by a bulletless cartridge 30 mm in length.

1910 Type reduction tube

Steel model created by the Manufacture Francaise d'Armes et Cycles de Saint-Etienne. It is similar to the models made by the S.F.M.

Steel 60 mm reduction tubes

Variants on S.F.M. models, with or without shoulder at the neck. Intertwined GG marking.

Steel reduction tube for conical bullet

It fires a conical bullet with an increased 9 mm diameter.

Bronze reduction tube for fire from 30 to 50 m

Also proposed by the S.F.M., this bronze reduction tube, containing a steel insert, permits fire from 30 to 50 m. It receives a cylindro-hemispherical bullet, with a shoulder at the base. There are cardboard presentation cases containing six reduction tubes and we can present them to shooting clubs or to the armorers.

Voisin Mecanicien reduction tube

False cartridge in turned steel, it receives a spherical projectile propelled by a powder only rimfire cartridge, because of this, its seating is eccentric. This cartridge carries on its side mention of **VOISIN MECANICIEN DEPOSE.**

Menessier reduction tube

False cartridge in turned steel, with removable connection cone, so as to ensure tightness via a leather seal. The rim carries the logo of the **Cartoucherie Francaise.** It receives a short lead cylindro-ogival bullet, produced by the Cartoucherie Francaise. The rimfire propulsive charge takes place in a misaligned chamber.

Systeme Jouvet

The Jouvet system of reduced power cartridges is composed of a cartridge adapter carrying a firing pin and being placed in the chamber of the Lebel rifle. It fires a short, self-propelled lead bullet, whose hollow base seals off the priming composition and the powder charge. A similar device also exists for the Gras rifle.

Photos

Steel systeme Pinson-S.F. reduction tube with spherical bullet for fire at 20-30 m. (Copyright Jean Huon).

Steel systeme S.F. reduction tube with short cylindro-ogival bullet for fire at 30-50 m (Copyright Jean Huon).

Box of bullets for the S.F. reduced power system.(Photo Yves Etievant).

Box of propulsive cartridges to fire tubes (Photo Yves Etievant).

Photos

Extract from the 1900 S.F.M. catalog (Jean Huon's archives).

1910 type firing tube by the Manufacture Francaise d'Armes et Cycles de Saint-Etienne (Copyright Jean Huon).

Long steel systeme GG firing tube (Copyright Jean Huon).

Steel firing tubes for conical bullets (Photo Yves Etievant).

Box of conical bullets for reduced power firing (Photo Yves Etievant).

Brass and steel S.F.M. reduction tube for 6 mm cartridge (Copyright Jean Huon).

Photo

Presentation case for reduction tubes (Copyright Jean Huon).

Photos

Voisin firing tube with eccentric drill hole. (Photo Philippe Mention).

Menessier firing tube with eccentric drill hole, projectile, and charge. (Photo Yves Etievant).

Projectiles for Menessier firing tube (Photo Yves Etievant).

6 mm double rim propulsive cartridges, produced by the Cartoucherie Francaise for the Menessier firing tube (Photo Yves Etievant).

Blank cartridges

Mle. 1886 blank cartridge

During large maneuvers we experiment with several types of blank cartridge:

- A and B series, unknown characteristics;
- C series, Mle. 1886 case with reinforced primer or Mle, 1886 M case with double primer, 1.20 g charge of A1 pyroxyl powder, fake bullet of compressed paper;
- D series, Mle. 1886 M case presenting minor defects (rejected for live cartridges), double-primed, charge of 1.28 g of EF powder, false cylindro-ogival bullet in compressed paper without meplat having a length of 33.5 mm. It is this model which was kept at first.

Mle. 1887 blank cartridge

Experimental blank cartridge with false cylindrical bullet in rolled paper.

ENT blank cartridge

Experimental munition developed by the Ecole normale de tir in 1888-1889. It receives a hollow wood bullet, ogival with meplat, whose characteristics are:

Length of the bullet:	30.25 mm
Diameter of the bullet:	8.20 mm
Diameter of the meplat:	4.85 mm
Diameter of the cavity:	5.70 mm
Depth of the cavity:	29.10 mm
Thickness of the wooden walls:	1.25 mm
Weight of the bullet:	0.53 g

Mle. 1890 blank cartridge

Experimental cartridge equipped with an unvarnished round-tipped straw paper bullet.

Mle. 1892 blank cartridge

Another experimental cartridge equipped with a rolled paper bullet. The false bullet is obtained by first soaking the bullet in oil and rolling it and then gluing it with shellac varnish. We then form it by molding in a hot matrix, heated by gas.

Manufacture at Puteaux and Toulouse (based on an S.F.M. drawing dated September 20, 1894).

Photos

Experimental Mle. 1886 Series C blank cartridge (Photo Philippe Mention).

Mle. 1887 experimental blank cartridge with rolled paper bullet (Photo Yves Etievant).

Photos

Experimental E.N.T. blank cartridge with wood bullet (Photo Yves Etievant).

Experimental Mle. 1890 blank cartridge with unvarnished round-tipped straw paper bullet (Photo Yves Etievant).

Experimental Mle. 1892 blank cartridge with varnished round-tipped straw paper (Photo Yves Etievant).

Drawing of an 1894 8 mm Lebel blank cartridge from the S.F.M. archives (Jean Huon's archives).

Mle. 1897 blank cartridge

It is the first regulation blank cartridge. It contains a new or reloaded Mle. 1886 D or 1886 D (a.m.) case, with an Mle. 1890 primer and an Mle. 1914 primer-cover as well as a charge of 1.30 g of special pyroxyl powder of EF type (exercice pour fusils). It is a powder constituted of small yellowish grains of irregular shape; it is composed of CP 1 and CP 2 nitrocelluloses, agglomerated with agar and stabilized with diphenylamine. The false straw paper bullet is soaked in oil, rolled and glued with shellac is hot stamped then externally varnished. It is hollow on the inside and it is green colored. This cartridge is usable in rifles and musketoons. From 1909 to 1911, this cartridge could have been made with cases lightly marked **B** instead of **ART D.**

Mle. 1905 blank cartridge

The Mle. 1897 blank cartridge was not usable in machine-rifles and machine guns, therefore we create in 1905 a blank cartridge with hollow natural alder wood bullet. We use it with a special barrel cap to crumble the projectile. Its propulsive charge is identical to that of the preceding model. From December 1917, we lightly modify the diameter of the cylindrical part of the false wood bullet. Alder, beech, or American maple woods can also be used for its manufacture.

Mle. 1905-27 blank cartridge

To preserve to false wood bullet under humidity, we impregnate it with a blue colored chemical product. This decision was initially made in August 1916, then reversed in December of the same year. We do not return to this until much later. We took the opportunity to adjust the tolerances of the charge of EF powder: 1.30 g + 0.05 or – 0.07 g (note of March 16, 1928).

Photos

Mle. 1897 blank cartridge, with false bullet in green straw paper. (Copyright Jean Huon).

EF powder (Copyright Jean Huon).

Packet of Mle. 1897 blank cartridges (Photo Philippe Mention).

Mle. 1905 blank cartridge, with false natural wood bullet (Copyright Jean Huon).

The dimensions of the exterior diameter of the false bullet have a tolerance of 8.1 mm + 0.20 or 0.10 mm (Note of June 17, 1929).

Mle. 1950 blank cartridge

Cartridge with false wood bullet painted in dark purple (eggplant), made at the Toulouse cartridge factory in 1950.

Photos

Mle. 1905-27 blank cartridge, with blue painted false bullet (Copyright Jean Huon – MAS).

Packet of Mle. 1905-27 blank cartridges loaded at Mans (Photo Philippe Regenstreif).

Late repackaging of Mle. 1905-27 blank cartridges by the Mans cartridge factory in... 1957! (Photo Philippe Regenstreif).

Mle. 1950 blank cartridge (Photo Yves Etievant).

Fuse cartridge

8 mm cartridge without bullet, case sealed by a crimped wad and loaded with 4 g of F 3 powder. It is used as a primer carrying tube for firing the shells of the 52 mm Sainte-Claire-Deville quick fire cannon.

Blank cartridges for movie production made from an 8 mm Lebel case

- Cartridge without bullet, loaded only with powder, made from a case shortened to around 26.5 mm and sealed by a cork lid;
- Cartridge without bullet, star-shaped crimp;
- Cartridge without bullet, case closed in the shape of a six-pedaled rose, with neck crimp and black varnish;
- Cartridge without bullet, with tronconically crimped case;
- Cartridge without bullet, with false bullet from a 7.5 mm blank cartridge, made of a plastic material.

7.5 mm blank cartridges mounted on a brass ring for movie production

This cartridge provides a 7.5 mm blank cartridge mounted on a ring of the dimensions of the 8 mm Lebel cartridge:

- Blank cartridge with false gold-painted wood bullet;
- Mle. 1958 or 1958 M 7.5 mm blank cartridge in white plastic material;
- Mle. F 1 7.5 mm blank cartridge in translucent white plastic material.

Blank cartridges for movie production made from a .348 Winchester cartridge

The .348 Winchester case is formed, then undergoes a double neck crimping before being closed in a rose-shape after charging.

Photos

Igniting cartridge (Philippe Mention).

Blank cartridges without bullets for cinema, made from 8 mm Lebel cases (Copyright Jean Huon & Photo Yves Etievant).

This type of cartridge was notably used during the filming of *Un long dimanche de fiancailles*. It functions as well in rifles as in machine guns modified to fire blanks.

False cartridges

- Brass false cartridge, 66 mm, turned to the dimensions of the Lebel cartridge and permitting firing of a blank cartridge for the .380 Knall signal revolver (9 x 17 R);
- Brass false cartridge, 70 mm, similar to the preceding, but a little longer and utilizing the same munition;
- Brass or turned steel false cartridge, 70 mm, the case presents three cylindrical parts connected by conic shoulders, its profile makes it easier to manufacture than the preceding version, it also fires the .380 Knall (9 x 17 R) signal revolver cartridge.

Photos

Blank cartridge for cinema made from a .348 Winchester case. (Copyright Jean Huon).

Blank cartridges without bullets for cinema, made from 7.5 mm blank cartridges mounted on an adaptor ring of the dimensions of the 8 mm Lebel rim. (Photo Yves Etievant).

False cartridges in brass or in steel turned to the dimensions (at left) or to approaching edges (at right) of the 8 mm Lebel cartridge, for the fire of a blank cartridge for .380 Knall (9 x 17 R) signal revolvers (Copyright Jean Huon).

Propulsive cartridges

Propulsive cartridge for Feuillette grenade

This is a cartridge without bullet, sealed in a star shape and were roughly made. It is charged with 3 g of BN3F powder, extra black powder charge.

Propulsive cartridge without bullet for training or message-carrying V.B. grenade

Cartridge without bullet destined for propulsion of the V.B. grenade used for training, message carrying grenades or signal flares. It is made of a primed Mle. 1886 D (a.m.) case, the charge is made of 2.80 to 3 g of BN-3F or USF powder, with an extra 0.60 g charge of superfine black powder placed at the bottom of the case. The case

neck is closed by embossing and is rendered waterproof by soaking in a mixture composed of yellow wax and paraffin. This cartridge was designated ***8 mm Kartusche 300 (f)*** in the German Army between 1940 and 1945.

Propulsive cartridge for reduced fire in the 81 mm mortar

Cartridge with short false bullet in a brass strip with four petals, with a strong crimp at the neck. The false bullet is almost entirely covered in brown wax (SFM 1934). Total length 58.3 mm.

Propulsive cartridges for 50 mm Mle. 1937 Lance-Grenades

- Cartridge with cylindrical case at rim, closed in rosette form, hunting-type primer. Marking **50 MLE 1937 S.F.** ;
- Cartridge with cylindrical case at rim, case closed by a convex brass disk, hunting type primer. Marking **50 MLE 1937 S.F.** ;

Photos

Propulsive cartridge without bullet for the fire of Feuillette grenades. (Copyright Jean Huon).

Propulsive cartridge without bullet for fire of training and message-carrying V.B. grenades or flares. (Photo Yves Etievant).

Packet of V.B. propulsive cartridges. (Photo Philippe Regenstreif).

Propulsive cartridge without bullet for reduced fire in the 81 mm mortar (Copyright Jean Huon).

Propulsive cartridge without bullet with shortened case for 50 mm Mle. 1937 Lance-Grenades. (Copyright Jean Huon).

- Cartridge with aluminum case, at rim, closed by a disk of varnished cardboard, slightly concave, hunting-type primer. Marking **M.G.M. 2-40.** ;
- 8 mm Lebel type cartridge, shortened to 27 mm, closed in rosette form, sealed with brown varnish. Hunting type primer marked **CF PARIS**. Rim marking **TE 2 50 C.** ;
- Cartridge with brass rim and 33 mm green cardboard case. Cardboard obturator. Rim marked **GEVELOT PARIS.**

Photo

50 mm mle. 1937 Lance-Grenades in action in Indochina. (Jean Huon's archives).

Proof cartridges

Proof cartridge

Mle. 1886 brass case marked **ART Px FG 3-87,** false cylindrical neutral-tint rolled paper bullet. Length of the cartridge 77.5 mm.

First test cartridge

Cartridge loaded with 3 grams of BF powder and firing a 21 gram cylindrical bare lead bullet.

Second test cartridge'

Cartridge loaded with 3 grams of BF powder and receiving the 15 gram balle M.

How do we measure the pressure developed by a cartridge in the chamber of an arm?

The *Crusher* gauge allows the measurement of chamber pressures during experimental fire or conformity tests of war materiel of small and medium calibers generally used as war munitions.

This process permits in addition to the verification of the profile of the munition, of controlling the pressure developed by the loading and therefore checking if the construction of the arm supports, without deformation, the utilization of this munition (pressure report, profile of the projectile and load) now called C.I.P. approval (commission internationale permanente) contituted of 14 members and of which only ammunition certified by this logo can be sold commercially in the concerned nations, which assumes that each munition other than those approved must under go the tests described in this paragraph.

Measurement principle

The chamber and the pressure control device as well as the munition are drilled vertically at a specific place (determined by the manufacturer), the case is notched in order to determine the exact position of the piercing in regards to the canal of the gauge piston (useful precaution in order not to spill the contents of the ase during introduction to the chamber).

At the end of the piercing, a sealed gauge block containing the pressure testing (crusher) cylinder on which is work is transmitted thanks to a piston.

This cylinder is constituted of an ingot of calibrated copper which is lodged in the clamping sleeve whose residual space is filled by a silicone grease, finally screwing on the anvil by bringing it into contact on the cylinder without blockage.

Firing recoils the pressure cylinder whose precise measure determines the resting height, and therefore the calculation of pressure can be performed, with the help of an abacus, which if P = f(HR).

Photos

First test cartridge (Photo Philippe Regenstreif).

Second test cartridge (Photo Philippe Regenstreif).

Drawing of the principle of the Crusher system applied to a rifle barrel (Alain Barrelier).

Pressure test Lebel rifle (Copyright Jean Huon).

Pressure test Lebel rifle registration token (Copyright Jean Huon).

Inert cartridges

Mle. 1886 metal inert cartridge

Completely nickeled balle M cartridge. The non-pierced case is marked **INF 86 M ENT** or **ART TE-IC 1-88.**

Mle. 1886 metal and wood inert cartridge

Balle M cartridge, with the body of the cartridge in turned hornbeam wood. The ogive, first in maillechort, then in copper, is pinned to the front of the body. The rim, in brass, provides the taper of an Mle. 1886 case; the primer-cover and the anvil of the case are pierced by a hole for the passage of the firing pin.

Mle. 1890 inert cartridge

Destined for the gendarmerie, it is composed of a brass case, with a cruciform brass bullet, with four longitudinal flutes. It can be mounted on a normal case or on a case pierced with four holes.

Mle. 1892 inert cartridge

This cartridge is more particularly destined for the Mannlicher-Berthier type arms because its charger-clips damage the false wood cartridges. The mle. 1886 or 1886 M case, but without anvil or primer, copper exterior, carries twelve cannelures on the body of the case. Certain models are not pierced, other present 13 mm from the front edge of the rim a 3.5 mm diameter hole. The type M bullet is formed from a lead core at the front and a copper envelope, a wooden plug goes from the lead core to the bottom of the case.

Photos

Inert mle. 1886 cartridge of metal and wood of the first type. (Photo Yves Etievant).

Inert mle. 1886 cartridge of metal and wood of the second type (Copyright Jean Huon).

Mle. 1890 inert cartridges with embossed bullets (Photo Philippe Mention).

Mle. 1892 inert cartridges with embossed bullets (Copyright Jean Huon).

Tool kit cartridge for the Mle. 1905, 1907 and 1907 T machine guns

False cartridge in bronze in the profile of the balle M and serving to verify the good functioning of the machine guns. It is part of the accessories kept in the No.1 accessory kits for APX 1905 and Saint-Etienne Mle. 1907 and 1907 T machine guns.

Inert cartridge with Mle. 1886 D bullet

Destined to test the good functioning of 8 mm arms and machine guns of all models, it is composed of an Mle. 1996 D case with primer-cover, it is pierced by a 3.5 mm diameter hole around 15 mm from the front end of the rim. The Mle. 1898 bullet is tin soldered to the case neck.

Mle. 1907 inert cartridge

This cartridge is at all points identical to the inert Mle. 1886 D, but it is entirely nickeled. There exists a variant with the bullet tinned up to the mid-neck.

Light inert cartridge

It is composed of a pierced nickeled brass case, on which is mounted a tinned Mle. 1923 bullet jacket.

Inert cartridge with Mle. 1932 N bullet

It is similar to the Mle. 1907 inert cartridge, but receives an Mle. 1932 N bullet

False cartridge in coppered nickel

False cartridge destined for collectors, it is close to the inert cartridge contained in the No.1 accessory cases for machine guns.

Photos

Tool kit false cartridge for machine guns (Copyright Jean Huon).

Packet of Mle. 1907 inert cartridges made at Tarbes (Copyright Jean Huon).

Inert Mle. 1907 cartridge (Copyright Jean Huon).

Inert Mle. 1932 N cartridge (Photo Yves Etievant).

Coppered brass inert cartridge (Copyright Jean Huon).

Pierced and chromed inert cartridge (Copyright Jean Huon).

Inert cartridge in cream white plastic material (Copyright Jean Huon).

Experimental aluminum case, made at S.F.M. (1902) (Photo Yves Etievant).

Cases in three pieces (Photo Yves Etievant).

Chromed false cartridge

Inert cartridge destined for collectors. Case pierced by various groups, on which is mounted any 8 mm projectile, notably 7.92 mm Mauser. The case is pierced with a transverse 2.5 mm hole located around 12 mm from the base. The assembly is entirely chromed.

False cartridge in plastic material

Single piece inert cartridge destined for collectors. It has the profile of the balle D and it is made in cream white plastic material.

False packet of cartridges for loading of bandoliers

In order to give weight to the bandoliers and to accustom the soldier to carrying their allotment of munitions, it was made from hollow cast iron cubes in the form of a dice with a size of 78 x 44 x 22 mm and whose mass of around 220 g corresponds to that of a cartridge packet. We wrap it with a piece of cloth from an old sheet.

It is from a note of December 4, 1905 that this accessory was retained to fill bandoliers, to replace the 11 mm Mle. 1879 inert cartridges. Its characteristics are defined in a technical data sheet of October 2, 1906

Other cartridges

Cases

Several experiments were made with particular cases:

- Maillechort case (SFM in 1891);
- Steel case (c. 1900 by STA);
- Aluminum case (c. 1902 by SFM), exists with and without markings;
- Cases in two parts: steel and brass (c. 1904-1905 at the Valence cartridge factory);
- Steel case (1906 at APX);
- Case in three pieces, existing in steel, maillechort, and in nickeled brass (Valence cartridge factory 1899-1900);
- Etc.

Bullets

Similarly, numerous experiments were performed with:

- Small and very-small caliber bullets: 4.5 mm (4.5 x 41 on the case of the modified 9 mm cane rifle), 5 mm, 6 mm (6 x 52 R and 6 x 53 R, Tarbes 1891), 7 mm;
- 8 mm balle M, measuring 28 and 29 mm in length;
- Bimetallic bullets (steel and tombac) of reduced caliber (6 mm, 6.5 mm and 7 mm), mounted on a reduced neck case;
- Etc.

Photos

Cast iron ballast for bandoliers (Copyright Jean Huon).

Section of the three-piece case (Photo Philippe Regenstreif's archives).

Experiments with small calibre (Photo Yves Etievant).:

- *4.5 x 41 R;*
- *6 x 52 R;*
- *6 x 53 R.*

7 x 51 R cartridge (Copyright Jean Huon).

6.5 mm bimetallic bullet mounted on a necked down 8 mm Lebel casing (1902-1903) (Photo Yves Etievant).

Bimetallic 7 mm bullets (Emeric Daniau).

Cartridges with ordinary bullets

Cartridge with long bullet

Experiments occurred with an extra long pointed ogival bullet, making the total length of the cartridge 84 mm, precluding its usage with repeating arms in service.

Semi-combustible cartridge

Developed by the Bouchet powder factory in 1903, it is composed of:

- A metallic rim carrying the primer and serving as the obturator, two models of rim were experimented with, 19 and 21 mm long;
- A powder core called BACF (B annulaire comprimee a fusil), of 3.20 g;
- A powder material jacked uniting the bullet to the core and also serving to protect the munition againt atomspheric agents and to consolidate all parts (weight 0.70 g);
- An mle. 1898 balle D.

The regulation cartridge weighs around 27.60 g and the semi-combustible cartridge permits a weight saving of 4.40 to 4.80 g. Although no information is mentioned in the trial report, the case of this cartridge seems to measure 44 to 45 mm.

Cartridge with 7.48 mm bullet

Necked-down case to receive a 7.48 mm diameter bullet. S.F.M. drawing of October 5, 1907 is signed Berthaud. Mr. Berthaud had collaborated with Daudetau in the conversion of the Lee-Metford rifle to one fed by stripper-clips, we don’t know if this cartridge is related to that project.

Vincent cartridge

On September 26, 1911, the Minister of War addressed the Ecole normale de tir, for review and evaluation, of a proposition by Mr. Vincent, director of Bridges and Roadways in Cajarc (Lot department). The project is of a silent cartridge, utilizing a liquified gas to propel it. The cartridge body, which forms a reservoir, was made of steel. It receives at its center an obturator, whose waterproof mounting would be ensured by rings made of antimony and lead mounted at the level of the neck and the case neck forms a reservoir. It is the rifle’s firing pin that chases the obturator to the front, until a cap allows the gas to escape the case and propel the projectile. The inventor recommended not to use his cartridge for normal combat, but only for ambushes or *secret firing*. The experimental commission at the Ecole normale de tir estimated that, although the use of the expansive force of the liquified or compressed gas might one day be implemented, this would require a long and thorough study. It does not seem that the actual conditions known of pressure and liquefaction temperature of gas permits obtention of a ballistic agent capable of giving a bullet in war a sufficient power at normal combat ranges.

Photos

Cartridge with long bullet (Photo Philippe Mention).

Semi-combustible cartridge (STAT).

Case of cartridge with 7.48 mm bullet (SFM – Jean Huon's archives).

Expansive 8 mm bullets

The S.F.M. made several models of expansive 8 mm bullets:

- 14.80 g pre-split ogival bullet
- 16.30 g half-hardened bullet.

These were never loaded on military 8 mm Lebel cartridges, they were destined for the Rival carbine. This was a hunting carbine made by the Manufacture Francaise d'Armes et Cycles de Saint-Etienne based on the Daudetau mechanisms originating from the Comapgnie des Forges et Acieries de la Marine a Saint-Chamond. We also could observe a cartridge with bullet pierced at the tip.

Photos

Expansive 8 mm bullets for hunting carbines (Copyright Jean Huon).

Cartridge with bullet pierced at the tip (Photo Philippe Mention).

Rival Carbine (Extract from the 1910 catalog of the Manufacture Francaise d'Armes et Cycles de Saint-Etienne).

Berthaud cartridge (Jean Huon's archives).

Jacketed 8 mm bullet

Experimented with at the Vincennes cartridge factory. Pointed bi-ogival projectile, with crimping groove. Hardened lead core, with 3% antimony, cast iron jacket, lined on both sides with a layer of copper-nickel. Length: 35.20 mm. *(Sources: drawing of December 1922).*

Balle BG

Duplex projectile composed of two elements mounted in tandem:

- One head ogive with flat toe, in brass with neckline, 24 mm long, with conic base and a crimping groove;
- Tail ogive, pointed, of the same nature and measuring 17 mm long, it is set with three 120 degree imprints.

(Sources: modified drawing of May 3, 1918).

Mixed bullet from Tarbes

The external dimensions are those of the Mle. 1898 bullet without groove. The jacket is in NAS steel (?).

Photos

Jacketed 8 mm bullet (Photo Philippe Mention).

Cartridge with duplex balle BG (Photo Philippe Mention)

The core is of a bi-metallic type, with the level of the ogive being an element of drawn steel, alloyed with 2% nickel, case-hardened and tempered. At the level of the base, the core is in lead with 20% antimony. Length: 39.20 mm. *(Sources: undated drawing).*

Balle D 1

Project of General Desaleux. Bi-ogival pointed projectile with groove. Jacketed in plated steel, core in lead with 3% antimony, concave base. Length: 37 mm. *(Source: drawing c. June 1932).*

Balles N

Studies by General Desaleux, relative to a new projectile, better performing than the balle D and not depositing copper on the barrels of machine guns. In addition, this project, launched in the years of 1923-1924, had to intertwine with the development of a new rimless 8 x 54.5 munition, all while also conserving the reserve of Hotchkiss machine guns.

Photos

Mixed bullet from Tarbes (Photo Philippe Mention).

There have been in particular a large range of projectiles experimented with, all having in common a pointed bi-ogival profile, with or without crimping groove, with a tail cone of 8.2 mm (with exceptions) inclined at 9 degrees (this is also with exceptions), but with variable lengths, and flat or concave tails:

- N 1, jacketed in maillechort without crimping groove, hardened lead core with 3% antimony, concave base, length 39.40 mm;
- N 2, jacketed in maillechort without crimping groove, core in hardened lead with 3% antimony, concave base, length 37.40 mm;
- N 3, jacketed in maillechort without crimping groove, bimetallic core in hardened lead with 3% antimony on the ogive on the top 4/5, base in aluminum, flat base, length 39.40 mm;
- N 4, jacketed in plated steel without crimping groove, hardened lead core with 3% antimony, concave base, length 39.40 mm;
- N 5, jacketed in plated steel without crimping groove, hardened lead core with 3% antimony, concave base, length 37.40 mm;
- N 6, jacketed in maillechort without crimping groove, hardened lead core with 3% antimony, concave base, length 41.35 mm;
- N 7, jacketed in plated steel without crimping groove, hardened lead core with 3% antimony, concave base, length 41.35 mm;
- N 8, jacketed in maillechort with crimping groove 24.55 mm from the tip, hardened lead core with 3% antimony, concave base, length 41.35 mm;
- N 9, jacketed in maillechort with crimping groove 23.55 mm from the tip, hardened lead core with 3% antimony, concave base, length 40.35 mm;
- N 10, jacketed in maillechort with crimping groove 22.55 mm from the tip, hardened lead core with 3% antimony, concave base, length 39.35 mm;
- N 11, jacketed in maillechort without crimping groove, hardened lead core with 3% antimony, concave base, length 39.35 mm;
- N 12, jacketed in plated steel without crimping groove, hardened lead core with 3% antimony, concave base, length 41.35 mm, tail cone inclined at 9 degrees;
- N 13, jacketed in plated steel without crimping groove, hardened lead core with 3% antimony, concave base, length 41.35 mm, tail cone inclined at 8 degrees;
- N 14, jacketed in plated steel without crimping groove, hardened lead core with 3% antimony, concave base, length 41.35 mm, tail cone inclined at 7 degrees;
- N 15, jackted in plated steel without crimping groove, hardened lead core with 3% antimony, concave base, length 41.35 mm, tail cone inclined at 10 degrees;
- N 16, jacketed in plated steel without crimping groove, hardened lead core with 3% antimony, concave base, length 39.35 mm;

- N 17, jacketed in maillechort-plated steel, with crimping groove at 24.5 mm from the point, hardened lead core with 3% antimony, concave base, length 39.35 mm;
- N 18, jacketed in 90/10 brass without crimping groove, hardened lead core with 3% antimony, concave base, length 39.35 mm;
- N 19, jacketed in maillechort-plated steel without crimping groove, hardened lead core with 3% antimony, concave base, length 39.35 mm;
- N 20, jacketed in 90/10 brass without crimping groove, bimetallic core in hardened lead with 3% antimony from the ogive up to mid-height and in aluminum to the base, concave base, length 39.35 mm;
- N 21, jacketed in steel-plated maillechort with crimping groove at 22.6 mm from the point, hardened lead core with 3% antimony, concave base, length 39.65 mm;
- N 22, jacketed in 90/10 brass without crimping groove, bimetallic core in hardened lead with 3% antimony from the ogive to 2/3 of the height and in aluminum to the base, concave base, length 39.35 mm;
- N 23, jacketed in 90/10 brass without crimping groove, bimetallic core in aluminum from the base to mid-height and in hardened lead with 3% antimony to the base, flat base, length 39.35 mm;
- N 24, jacketed in 90/10 brass without crimping groove, bimetallic core in aluminum from the ogive to 2/3 of the height and in hardened lead with 3% antimony to the base, flat base, length 39.35 mm,
- N 25, jacketed in maillechort-plated steel with crimping groove 24.5 mm from the point, hardened lead core with 3% antimony, 10 mm tail cone, concave base, length 40.35 mm;
- N 26, jacketed in maillechort-plated steel with crimping groove 24.5 mm from the point, hardened lead core with 3% antimony, 12 mm tail cone, concave base, length 41.75 mm;
- N 27, jacketed in maillechort-plated steel with crimping groove 28.5 mm from the point, hardened lead core with 3% antimony, concave base, length 43.35 mm;
- N 28, jacketed in maillechort-plated steel with crimping groove 28.5 mm from the point, hardened lead core with 3% antimony, 10 mm tail cone, concave base, length 44.35 mm;
- N 29, jacketed in maillechort-plated steel with crimping groove at 28.5 mm from the point, hardened lead core with 3% antimony, 12 mm tail cone, concave base, length 45.75 mm.

(Sources: drawings number 3598 and 5383)

It is finally balle N 17 which is adopted under the name balle Mle. 1932 N.

Tracer cartridges

Bullets with elongated pockets

From 1927, the S.F.M. developed a versatile tracer pocket which can be mounted in 7.65 mm and 7.92 mm bullets. We also experiment with this on 8 mm Lebel bullets, by modifying the balle D tracer, without tinning.

Some examples mounted on cases marked **SF 2 30 SF** have been observed:

- One with dark red varnish
- The other with green varnish.

We look to lengthen the tracer pocket to augment the duration of the luminous trace, but the famous lengthened pocket modified the mass and the center of gravity of the projectile, and by consequence, its trajectory and its range are also found to be modified. The trials were not successful. The solution arrives with the Mle. 1951 tracer bullet, which is created at the moment when we ceased to make the ammunition.

Penetrating cartridges

Pralon cartridges

In order to fight against torpedo boats, whose hulls are mounted with armor, Captain Pralon imagined a munition with a steel bullet provided with a copper belt. He managed to convince the Ministry of War of the efficiency of his invention. The first trials are conducted in 1886 with firing tubes and we find that 25 mm of steel were perforated at the muzzle. On July 30, 1887, the Minister of War makes the decision to manufacture 1,010 Pralon rifles, 1,000 would be single shot and the remaining 10 would be repeaters. This command had to be realized without impairing the start-up of production of the Mle. 1886 rifle. On September 27, the command is reduced to 500 single shot rifles. Several arms are ready on December 22. The Pralon rifle, in its most common version, is a single shot arm. Its manufacture borrows the most possible pieces from the Mle. 1885. This is a bolt-action arm, given a locking system of interrupted threads. The barrel contains eight, then six grooves having no more then 10 degrees of final inclination. The first trials make irregularities in operation appear due to case swelling and difficulties in extraction. We envisage at this moment abandoning the bolt-action breech to the benefit of a breech of the Comblain type, but, finally, we just lightly rectify the outline of the case to facilitate extraction and the E.C.P. went on to make 10,000 cartridges of this new profile. The trials were performed at Versailles in 1888, then at Lorient by the Navy the next year. The trials reveal that the performance of the 8 mm Pralon projectile was superior to that of the balle M of the Lebel rifle, but that the damage caused to torpedoes was insufficient. Finally, the project is abandoned.

We also created penetrating bullets with a belt for experiments in the Mle. 1886 rifle.

Photo

Lengthened well tracer cartridges (Copyright Jean Huon).

Chartier bullets

Cartridge proposed by Lieutenant Colonel Chartier in 1907. The case is in aluminum bronze, it receives a penetrating bullet with the profile of the balle D but whose base is ovoid. It is made with a soft steel core, with a copper sleeve on the lower two thirds of its height. Length of the projectile: 38.6 to 38.8 mm. Weight: 10.10 to 11.21 g.

Rouxeville bullets

Project presented in March 1916 by Captain Rouxeville, under the name Rouxeville-Senfftheben. It is a balle D with steel ogive.

Vitus bullets

Penetrating projectiles developed by Mr. Vitus, mechanic from Epinal. These are bimetallic cartridges made of a copper alloy jacket (bronze or brass) and a steel core. There exist two variants:

Photos

Pralon torpedo rifle (Copyright Jean Huon – Rally Collection).

Cartridge and 8 mm Pralon bullets (Photo Christian Clanet and Yves Etievant).

Vitus penetrating cartridges (Photo Yves Etievant).

- Vitus bullet with shouldered core:

Total length:	31.14 mm
Length of the brass sabot:	20.06 mm
Core diameter:	6.12 mm
Sabot diameter at base:	8.15 mm
Sabot diameter at maximum:	9.08 mm

Weight:	9.86 g

- Vitus bullet with ogival core

Total length:	30.50 mm
Length of brass sabot:	20.09 mm
Core diameter:	6.12 mm
Sabot diameter at base:	8.15 mm
Sabot diameter at maximum:	8.83 mm
Weight:	10.04 g

Bergery bullet

Project for a penetrating projectile conceived by Mr. Bergery of Cannes in 1924. The hardened steel bullet is in the shape of a water droplet. It is associated with a rear sleeve made of duralumin given two guide belts. The mass of the assembly was 11.03 g. When the inventor submitted his project to the S.F.M., he demanded a quote for the manufacture of the projectile and its mounting on 8 mm Lebel casings. He also wanted the loan of an Mle. 1886-93 rifle with modified chamber and armored plates to perform trials.

Photos

Trials with belted projectiles (Alain Barrelier's archives).

Bergery penetrating cartridge (Photo Philippe Mention).

S.F.M. 1927 bullet

Sub-caliber steel cylindro-ogival bullet, two observed specimens:

- One with diameter 7.51 mm, with 8.10 mm brass belt, mounted on a case marked **SF 1 27 SF**;
- The other not mounted and marked 2, diameter 7.90 mm, belt in light alloy with diameter 8.39 mm; at the base, there are two helicoidal steel fins; the total length is 43.55 mm for a mass of 8.16 g.

Tungsten core penetrating bullet

This was a trial from 1935. The profile of the projectile is pretty close to that of the balle D, the bullet measure 39.2 mm and weighs 13 g.

Photos

Drawing of the Bergery bullet provided from the S.F.M. archives, drawing No. 8123 of December 21, 1923 (Jean Huon's archives).

S.F.M. 1927 penetrating cartridge (Copyright Jean Huon).

Penetrating bullet with tungsten core (at left), compared with an Mle. 1886 P bullet (at right) (Photo Yves Etievant).

Incendiary cartridges

Special balle PH

Solid brass projectile with the profile of the balle D, tinned on the interior and the exterior and given a crimping groove. The incendiary composition is housed in the ogive. At its base is a brass ring, placed in front of the obturation vent for the Darcet alloy and a plug obturator maintained by a tinplate wafer waterproofed with a varnish. *(Sources: ECP drawings of March 6 and April 27, 1917).*

Trimetal PH incendiary bullet

The projectile contains a copper jacket; the head core and the wedging tube are replaced by a single hollow piece, in steel enclosing the incendiary composition, it is obturated at the base by a plug in turned brass. Its length is 38 mm. *(Source: ECP drawing of October 5, 1917)*

Photo

Drawing of the balle speciale PH (Photo Philippe Mention).

Vincennes Workshop incendiary bullet

Pointed bi-ogival projectile with a light decrease in diameter at the level of crimping. Jacketed in copper steel, it receives at the head the incendiary composition with white phosphorus base. It is obturated by a hardened lead core, waterproofed at the level of the base by a red varnish. This core is capped with a plug of the same nature and with tronconic form, on the periphery of which were laid out four large longitudinal grooves, matching the incendiary charge with the obturator vent by a fusible alloy. Length: 37.8 mm. Weight: 9.5 g. *(Source: drawing A VIS non dated).*

Bi-ogival incendiary bullet

Pointed bi-ogival projectile, with a cylindrical piece at the level of the friction zone in the barrel. Study was not continued. *(Source: STA drawing of December 13, 1937).*

Photo

Drawing of the PH trimetallic incendiary bullet (Photo Philippe Regenstreif's archives).

Drawing of the Vincennes Workshop incendiary bullet (Photo Philippe Mention).

Armor-piercing incendiary cartridges

Cylindro-ogival projectile with meplat, with the profile of an elongated balle Mle. 1886 M. The soft steel jacket receives at the level of the ogive a brass primer holder, capped with a steel washer. At the base, a lead jacket holds a pointed cylindro-ogival core in tempered steel which plays the part of the penetrator. The space left free at the front of the projectile receives the incendiary composition. The total length is 34 mm. This projectile is conceived in the same manner as the incendiary projectiles or the explosive bullet described below. *(Source: drawing from the Vincennes cartridge factory dated to July 1918).*

Explosive cartridges

Explosive cartridge

Cylindro-ogival cartridge with meplat, with the profile of an elongated balle Mle. 1886 M, mounted on an Mle. 1886 D case. The jacket is in soft steel, and it receives a hollow interior lead core, to which is given a maillechort well holding an explosive charge.

Photo

Drawing of the BPI armor-penetrating incendiary cartridge (Philippe Regenstreif's archives).

At its base is found a brass striker maintained in a hardened and wound brass tube, both these are kept in a white metal well, capped with a copper disk. The projectile base is occupied by a lead plug. The total length is 35 mm. *(Source: undated drawing).*

Cartridge with No. 1 special bullet

Less complex than the preceding, this explosive bullet contains a soft steel jacket in the profile of the balle M. At the end is found a lead core at the level of the ogive, a lead sleeve forms a sheath surrounding the active elements and obturates the base. It encloses, from top to bottom:

- A brass well obturated by a disk of the same nature and encloses the explosive charge with the primer composition at the base;
- Another disk in brass foil closes the well;
- A brass tube serves as the firing pin's guide;
- This inertial firing pin is here called striker, it is kept at its base by a soft steel clip.

This cartridge had a Type No. 1, followed by a Type No. 1 modified (STA drawing of May 18, 1918) and finally a N 1 Bis (STA drawing of May 18, 1918). These differ only by minor dimensional details. The length of the projectile is in the last two cases 38 mm.

Photo

Drawing of the 8 mm cartridge with explosive bullet (Jean Huon's archives).

Cartridge with No. 2 special bullet

Another explosive cartridge, it is composed of the same jacket and the same lead sleeve as the preceding. But, here, the firing pin is fixed and it is placed close to the ogive. It is the well that contains the explosive that is retained by a clip and which is displaced by the impact. *(Source: STA drawing of February 20, 1918).*

Reduced range cartridges

Reduced range bullets for rifles and musketoons

Before the placement in service of the truncated bullet, we experimented with diverse types of projectiles, all from the balle D, but with several profiles.

Reduced range cartridge for machine guns

Before the adoption of the milled bullet for fire in machine guns, we experimented with, in 1909, a projectile drilled with four longitudinal channels.

Photos

Drawing of the No. 1 special bullet (Photo Philippe Mention).

Drawing of the No. 2 special bullet (Photo Philippe Mention).

Reduced range cartridge (circa 1910)

Experimental cartridge with short aluminum bullet, given an ogive at the head and a bottleneck at the level of the body. Length 26.3 mm, mass 2.6 g.

Reduced range cartridges (1920-1930)

During the interwar period, we experimented with diverse models of reduced range cartridges:

- Balle D cartridge, with five turned gorges;
- Balle D cartridge, with four transverse holes of different diameters;
- Balle D cartridge shortened by 2 mm, with hollow point and two small transverse holes above the crimp;
- Mle. 1923 C cartridge, shortened by 2 mm, with hollow point;

- Mle. 1923 C cartridge, shortened by 2 mm, with hollow point and two small transverse holes above the crimp;
- Mle. 1923 C cartridge, shortened by 3 mm, with hollow point.

Photos

Experiment with tubular bullet with four grooves for range fire with a machine gun. (Photo Yves Etievant).

Reduced range cartridge with experimental aluminum bullet, machined replica based on a period drawing (Copyright Jean Huon).

Reduced range cartridge with aluminum bullet, already foreshadowing the shooting gallery cartridge (Photo Yves Etievant).

Experimental reduced range bullets for rifles and musketoons (Photo Yves Etievant).

Experimental cartridge with turned balle D (Copyright Jean Huon).

Experimental cartridge with pierced balle D (Copyright Jean Huon).

Experimental cartridge with pierced balle D and hollow point (Copyright Jean Huon).

Experimental cartridge with balle Mle. 1923 C shortened by 2 mm and with hollow point (Copyright Jean Huon).

Experimental cartridge with balle Mle. 1923 C shortened by 3 mm and with hollow point (Copyright Jean Huon).

Experimental cartridge with balle Mle. 1923 C shortened by 2 mm, pierced. and with hollow point (Copyright Jean Huon).

Blank cartridges

Blank cartridge with false tubular brass bullet

The case receives a brass tube closed with a petal shape, which traverses it over its entire length (circa 1895).

Blank cartridge with wood bullet

Blank cartridge, with red-colored linden wood bullet, hollow and cut with the profile of the balle M, loaded with 1.30 g of EF powder. *S.F.M. Drawing No. 7281 of September 25, 1924*

Photo

Drawing of the 1924 pattern blank cartridge with wooden bullet (Philippe Mention's Archives).

Propulsive cartridges

Cartridge without bullet, case elongated to 56 mm and crimped in a star pattern.

Inert cartridges

Inert cartridge with copper bullet

Inert cartridge with copper projectile, in the profile of the balle M, in tinned copper. The case dated 1893 possesses a tin-filled primer housing.

Weighted inert cartridge

Weighted inert cartridge, case dated 1911, nickeled and fluted. Mle. D bullet.

The markings of French cartridges

The French 8 mm Lebel cartridges carry on the rim a marking where we find:

- At 12 o'clock, the name of the cartridge factory;
- A 6 o'clock, the name of the metal supplier of the case;
- At 9 o'clock, the quarter of production;
- At 3 o'clock, the year of manufacture.

Cartridge factory markings

- A. AR Atelier de Construction d'Alger
- A. TE Atelier de Construction de Toulouse

Photos

Propulsive cartridge with 56 mm case (Copyright Jean Huon).

Inert cartridge with tinned copper bullet (Photo Yves Etievant).

Weighted inert cartridge with fluted and nickeled case (Photo Yves Etievant).

- A. VE Atelier de Construction de Valence
- A. VIS Atelier de Construction de Vincennes
- A. VF Unidentified
- ADI Atelier de Construction de Douai
- APX Atelier de Construction de Puteaux
- ARS Atelier de Construction de Rennes
- ATS Atelier de Construction de Tarbes
- CN Ateliers Mecaniques de Normandie
- CP Cartoucherie Leon Paulet a Marseille
- DB Etablissements Delaunay-Belleville
- DTE Unidentified
- ECP Ecole centrale de pyrotechnie a Bourges
- EDB Etablissements Delaunay-Belleville
- ENT Ecole normale de tir (prototypes) linked to one such marking
- INF (infanterie)
- G or GG Societe Gevelot
- IE Industrie d'Etat (contract concluded before 1914 between the state and private industry).
- LM Cartoucherie du Mans
- MGM Manufacture Generales de Munitions a Bourg-les-Valence (Drome)
- MR Manufacture de Machines du Haut-Rhin (Manurhin)
- Mt V Atelier de Chargement du Mont-Valerien
- oyj Atelier de Construction de Tarbes
- pas Atelier de Construction de Toulouse
- SF Societe Francaise des Munitions
- TE Atelier de Construction de Toulouse
- TH Cartoucherie de la Seine
- QC SFM and Gevelot for Vietnam

In principle, the military cartridge factories possessed the manufacture workshops and the charging workshops, but certain among these were separate: for example, Puteaux was a manufacture workshop and Mont-Valerien was a charging workshop.

The plans of the Minister of War in 1891 planned for possible loading workshops in times of war:

- BA Bastia
- BET Belfort
- BN Besancon
- BT Brest
- BRN Briancon
- CG Cherbourg
- EL Epinal
- GE Grenoble
- LS Langres
- LE Lille
- LN Lyon
- ME Maubeuge
- NE Nice
- RES Reims
- TN Toulon
- VN Verdun

Metal supplier markings

Markings relating to metal suppliers having served to make the cases and projectiles of 8 mm Lebel cartridges.

- B Compagnie du Duralumin et du Cuivre a Boisthorel
- BO Societe Metallurgique de la Bonneville
- Bs Atelier de laminage de Bourges
- BS Atelier de laminage de l'Ecole de pyrotechnie
- C Compagnie Francaise des Metaux a Castelsarrasin
- CY Baraguey, Fouquet et Cie a Chagny
- D Societe d'electro-metallurgie de Dives
- E Eschger Ghesquiere et Cie
- EG Eschger Ghesquiere et Cie
- F Trefilerie et Laminoirs de la Mediterranee a Saint-Louis (formerly Societe Huart et Cie a Marseille)
- G Compagnie Francaise des Metaux a Givet
- H Hemerdinger
- I Societe de Metallurgie Franco-Belge a Issy-les-Moulineaux (subsidiary to S.F.M.)
- IC Societe industrielle et commerciale des metaux
- J Compagnie francaise du bi-metal a Joinville-le-Pont
- L Letrange et Cie a Saint-Denis
- M Compagnie generale d'electricite (Etablissements Mouchel) a Bonthorel (Orne)
- P Societe anonyme des mines et fonderies de Pontgibaud a Coueron
- PC A. Gramont a Pont-de-Cheruy
- R Societe anonyme des trefileries et laminoirs du Havre (old Etablissements Lazare Weiler et Societe cooperative de Rugles reunis)

- S Societe industrielle et commerciale des metaux becoming the Compagnie Fancaise des Metaux a Serifontaine
- V Societe anonyme des fonderies et laminoirs de Biache Saint-Waast

Photos

Mle. 1886 case ECP 1887

Mle. 1886 M case Rennes 1896

Mle. 1886 D case Rennes 1910

Mle. 1886 D case without primer groove

Lightened case firing blank (1909-1911)

State industry S.F.M. 1907

Commercial S.F.M. cartridge

1st type Mle. 1886 D (a.m.) case (1911-1915)

2nd type Mle. 1886 D (a.m.) case

Mle. 1886 D (a24) case Mle. 1924 A primer

Mle. 1886 D (sf) case S.F.M. primer

Gevelot export production

8 mm Lebel cartridge headstamps (Copyright Jean Huon & Yves Etievant).

Foreign cartridges

We also find 8 mm Lebel cartridges made by foreigners:

Germany

Cartridges with ordinary bullets (1914-1918)

In Germany, from the end of the 19th century the Deutsche Waffen und Munitions Fabriken produced 8 mm Lebel cartridges according to the DWM 472 reference. During the First World War, Polte of Magdeburg created ordinary and tracer cartridges. Ordinary cartridges were close to 7.92 mm sS bullets, they were made with a hardened lead core and a copper steel jacket. The length was 35 mm and the mass 12.80 g. Marked **P**.

Requisitioned cartridges (1940-1945)

Like they did in all occupied countries, the Germans captured and reused various types of materiel, arms, and munitions taken from their adversaries. They methodically attributed to this materiel a particular nomenclature, and as concerns the 8 mm Lebel cartridges, they received the following designations:

- Balle D cartridge: *8 mm Patrone s. S. 304/1 (f) ;*
- Balle 1932 N cartridge: *8 mm Patrone s. S. 304/2 (f) ;*
- Balle T cartridge: *8 mm Patrone S. m. L'spur 303 (f) ;*
- Balle P cartridge: *8 mm Patrone S. m. K. 305 (f) ;*
- Cartridge with milled bullet: *8 mm Ubungspatrone 308/1 (f) ;*
- Cartridge with truncated bullet: *8 mm Ubungspatrone 308/2 (f) ;*
- Propulsive cartridge without bullet: *8 mm Kartusche 300 (f).*

These munitions could have been provided with labels on top of French packets or could have undergone repackaging.

Particular fabrications

In 1943-1944, the Germans had manufactured at the Tarbes and Toulouse cartridge factories the Mle. 1932 N cartridge, with steel and brass cases (see above). They also envisaged creation of cartridges with s.m.E. type bullets, with composite lead and soft steel core, but the project does not seem to have been carried out successfully.

Werkzeugpatronen

The Germans made inert cartridges, by modification of cartridges with ordinary bullets. We can observe multiple types:

- Cartridge with balle 1932 N, case pierced with four holes;
- Cartridge with balle 1932 N, soldered with tin, bullet pierced with a transfixing hole and case pierced with two transfixing holes;
- Cartridge with balle 1923 N, case pierced with three holes;
- Entirely tinned cartridge, case pierced with two transfixing holes;
- Cartridge with false turned brass bullet, case pierced with two large holes;
- Cartridge with false turned brass bullet, bullet and cases each pierced with two transfixing holes.

Photos

Rim of a cartridge made by DWM (Copyright Jean Huon).

Marking of an 8 mm Lebel cartridge made by Polte (Copyright Jean Huon).

German balle D cartridge (Copyright Jean Huon).

Drawing of a German 8 mm Lebel cartridge case (Photo Philippe Regenstreif).

Drawing of an ordinary bullet for a German 8 mm Lebel cartridge (Photo Philippe Regenstreif).

Drawing of a German S.m.E. type bullet project (Photo Philippe Regenstreif).

Inert cartridges (Copyright Jean Huon).

Repackaging of balle D cartridges (1914-1918)

Simple repackaging of balle D cartridges

Repackaging of balle D cartridges (unknown origin)

Repackaging of balle D cartridges (unknown origin)

Repackaging of 1932 N cartridges with German lot number

Repackaging of French 1932 N cartridges

Simple repackaging of 8 mm balle P cartridges

Box of Mle. 1886 D cartridges loaded at F.N. Herstal

German packaging for 8 mm Lebel cartridges (Copyright Jean Huon).

Austria

From the start of the 20th century, the Seraphin Keller cartridge factory at Hirtenberg (later Keller & Co.) produced 8 mm Lebel balle M ammunition. Also, Hirtenberger Patronen Zundhutchen und Matallwarenfabrik, at

Hirtenberg, made ordinary and tracer cartridges on the behalf of the Austro-Hungarian Army (marked **H**) during the First World War. Between the wars, other military contracts were honored, notably green-tipped tracer cartridges for Italy or Spain. These were marked ***1936** or were marked with three stars. Of the same origin, we also find white cartridges with a false straw paper bullet painted green or orange.

United States

We had produced in the United States, during the First World War, 267,700,000 8 mm Lebel balle D cartridges mounted on Mle. 1886 D cases, for the needs of the Allies (France, United States, and maybe others). They were made by:

- Remington Arms Co. at Bridgeport, Connecticut (marked **REMINGTON** or **REM-UMC** or **RA**);
- Robin Wood Ammunition Co. at Swanton, Vermont. Created in 1904, this cartridge factory was bought by Remington in 1916, it closed its doors in 1920 (marked **R.H.A. Co.**);
- Western Cartridge Company, at East Alton, Illinois (marked **WESTERN)**;
- Winchester Repeating Arms Co., New Haven, Connecticut (marked **W.R.A.** or **W.R.A. Co**).

Photos

Rim of a cartridge made by Hirtenberger for the Spanish Republicans (Copyright Jean Huon).

Section of an Austrian cartridge produced by Keller (Copyright Jean Huon).

Austrian tracer cartridge (Copyright Jean Huon).

Rim of an American military balle D cartridge made for the Allies by Remington (Copyright Jean Huon).

American balle D cartridge (Copyright Jean Huon).

Packet of 8 cartridges made by U.M.C. (Copyright Jean Huon).

Packet of 20 cartridges made by Remington-U.M.C. (Swanton factory) (Copyright Jean Huon).

Rim of an American balle D military cartridge made for the Allies by Robin Wood Ammunition Co during the 2nd quarter of 1916 (Copyright Jean Huon).

Packet of 8 cartridges made by Robin Wood (Copyright Jean Huon).

Packet of 8 cartridges made by Western in May 1916 (Copyright Jean Huon).

Rim of an American balle D military cartridge made for the Allies by Western Cartridge Company in November 1915 (Copyright Jean Huon).

American blank Mle. 1905-27 cartridge (maybe reloaded in France) (Copyright Jean Huon).

Rim of an American blank military cartridge made for the Allies by Remington during the 2nd quarter of 1916 (Copyright Jean Huon).

The cases were made with Berdan or Boxer primers. Certain American cartridge cases could have been reused in France for the creation of Mle. 1905-27 blank cartridges. We also experimented, in 1917, with a targeting cartridge made by drilling the front part of the ogive of the bullet and receiving a well with a smoke composition. Between the wars, Remington created, for cinema, blank cartridges, without bullet, with case obturated by a cardboard operculum sealed at neck level (type Blank M1909). Until the 1950s, Remington produced 8 mm Lebel cartridges loaded with a semi-jacketed 170 grain (10.9 g) bullet. The projectile mounted on this ammunition is identical to that which we find on 7.92 x 57 cartridges, with a diameter of 8.10 m; we are far from the real dimension of the 8 mm Lebel bullets whose real caliber must be between 8.25 and 8.30 mm! There also exist proof cartridges whose case is tinned (marked **R.H.A. Co. 3-16).** Finally, it should be known that some lots were not exactly conforming to the profile of the 8 mm Lebel case.

American blank cartridge made by Remington for cinema (Copyright Jean Huon).

Box of 8 mm Lebel cartridges with semi-jacketed bullets used for packing blank cartridges for cinema (Copyright Jean Huon).

Semi-jacketed American cartridge produced by Remington (Copyright Jean Huon).

Rim of a commercial cartridge made by Remington (Copyright Jean Huon).

Box of 8 mm Lebel cartridges with semi-jacketed 170 grain bullets made by Remington, with a label from the Swiss federal munitions depot at Thun placed over it (Copyright Jean Huon).

American proof cartridge with tinned case (Photo Yves Etievant).

American 8 mm Lebel cartridge, with an error manifesting in the profile of the case (Photo Yves Etievant).

Ethiopia

Cartridge with ordinary pointed ogival bullet jacketed in maillechort, with very pale grey-pink sealing joint. It is an S.F.M. contract, whose initials figure on the case rim.

Photos

French cartridge for export, destined for Ethiopia (Copyright Jean Huon).

Rim of the cartridge produced by S.F.M. for Ethiopia (Copyright Jean Huon).

Ethiopia notably used Hotchkiss 8 mm machine guns (Military Archives Center).

France

S.F.M. export contracts, with ordinary bullets constructed with jackets in tombac, maillechort, soft coppered steel, or cupronickel plated or bonderized and waxed.

Great Britain

In Great Britain, the 8 mm Lebel cartridges were made by:

- Aerators Ltd (marked **ASL**);
- Birmingham Metals and Munitions Co. (marked **B.M.&M. Co.**);
- Greenwood & Batley Ltd (marked **G & B**);
- Kynoch at Birmingham (marked **K**);
- An unidentified maker produced balle D cartridges on whose rim was marked **86 D AA** (AA signifying “amorcage anglais” - English priming).

Photos

Packet of Mle. 1886 N cartridges for export (Copyright Jean Huon).

Rim of a cartridge produced by S.F.M. for export in 1950 (Copyright Jean Huon).

French cartridge destined for export, bullet jacketed in tombac (Copyright Jean Huon).

Rim of a British Mle. 1886 M cartridge manufactured by Kynoch (Copyright Jean Huon).

Rim of a British cartridge manufactured by Greenwood & Batley Ltd (Copyright Jean Huon).

British balle M cartridge (Copyright Jean Huon).

British Mle. 1905-27 blank cartridge (it may have been reloaded in France) (Copyright Jean Huon).

Greece

Balle D cartridges made by the Hellenic powder and cartridge factories at Athens-Eleusis (marked **EK** + with Greek letters).

Photos

Greek balle D cartridge (Copyright Jean Huon).

Rim of a Greek cartridge produced by the Hellenic Powder & Cartridge Factories in 1938 (Copyright Jean Huon).

Box of 10 Greek cartridges (Copyright Jean Huon).

Packet of 200 Greek 8 mm Lebel cartridges curiously marked as caliber 7.85 mm (Copyright Jean Huon).

Italy

Italy produced:

- Ordinary balle D cartridges mounted on the Mle. 1886 D (a.m.) case. They were manufactured by the Societa Metallurgica Italiana at Campo Tizzaro (marked **SMI**) or by the Bologna Pyrotechnie (marked **TM**);
- Blank cartridges with green-colored wood bullet;
- Inert cartridges with fluted bullet, with a wood insert.

Japan

Ordinary cartridge made by Japan at the Toyo Seiki society for the Republic of South Vietnam.

Poland

Manufacture at Wojskowych Zakladach Amunicji Karabinowej at Warsaw, in a factory built from the machines recovered from the various munitions factories deemed war reparations, with German and Austro-Hungarian provenance. Situated in the heart of the city, in the antiquated and very small locales, with worn and outdated machines, it only operates a small amount of the time, contenting itself with reloading fired French cases, despite a more consequential production plan, and would be closed in 1925. This followed a ministerial decision to install military munitions industry at Skarzysko Kamienna in Central Poland (out of reach, in principle, from new bomber bases... in Germany, East Prussia, and the USSR). Manufacture was limites to some experimental lots, notably in 8 mm Lebel and in 8 x 50 R Mannlicher (marked **WWAK**).

Photos

Italian blank cartridge (Copyright Jean Huon).

Italian inert cartridge (Copyright Jean Huon).

Italian balle D cartridge (Copyright Jean Huon).

Rim of the Italian cartridge made by the Societa Metallurgica Italiana (Copyright Jean Huon).

Marking of the Polish production by WWAK (Photo Philippe Regenstreif).

Manufacture at Pocisk Polska Akcyjna at Warsaw (marked **PK**), was carried out with:

- Ordinary cartridges;
- Tracer cartridges;
- Mle. 1905 and 1905-27 blank cartridges with natural wood or colored purple or blue;

- Propulsive cartridges without bullets for V.B. message carrying, training, and flare grenades;
- Inert cartridges with fluted cases.

Finally, there exists a firing tube for reduced fire, receiving a short lead bullet; the case is (awkwardly) fluted.

Photos

Polish balle D cartridge (Copyright Jean Huon).

Rim of the Polish cartridge manufactured by Pocisk Spilka Akcyjna at Warsaw (Copyright Jean Huon).

Label of a packet of 8 mm Lebel Mle. 1886 D (a.m.) cartridges made by Pocizk. (Photo Philippe Regenstreif).

Packet of two five-cartridge clips made in France and repackaged in 1939 by the State Munitions Factory No. 1 in Warsaw (Copyright Jean Huon – Translation Philippe Regenstreif).

Polish blank cartridges (Copyright Jean Huon).

Polish propulsive 8 mm Lebel cartridges without bullets for V.B. training grenades (Copyright Jean Huon).

Polish inert cartridge (Copyright Jean Huon).

Polish reduced caliber tube (Copyright Jean Huon).

Label of a Polish box of 8 mm Lebel blank cartridges (Photo Philippe Regenstreif).

Packet of Polish 8 mm Lebel propulsive cartridges for V.B. training grenades (Photo Philippe Regenstreif).

Czechoslovakia

Ordinary cartridge of the 1932 N type, contracted by Sellier & Bellot for Italy, also used by the Spanish Republicans (marked **P 1935)**.

South Vietnam

Cartridges made by Gevelot for the Republic of South Vietnam until the 1960s. We know of several variants:

- ordinary Mle. 1932 N cartridges;
- Tracer cartridges (Mle. 1951?);
- Blank cartridges with violet-painted wood bullets.

They are marked **QC-G.**

Yugoslavia

Yugoslavia produced, from the 1950s to the 1970s, 8 mm Lebel ammunition for export, this ammunition is notable for having been delivered to the FLN in Algeria and to the Viet Cong in Vietnam.

Modern cartridges

Modern cartridges for the commercial market and reloading elements for shooting are discussed in Chapter 2.

Photos

Blank cartridge produced by Gevelot for the Republic of South Vietnam (Copyright Jean Huon).

Rim of the Gevelot cartridge for the South Vietnamese Army (Copyright Jean Huon).

Label of a 10 cartridge box of 8 mm Lebel made by Gevelot for South-Vietnam.

10 vien = 10 cartridges

Ordinary balle 8 mm

Lo QC-G 69-1962 = Lot QC-G (Gevelot) 69-1962

Quan Doi Viet-Nam Cong Hoa = Army of the Republic of Vietnam

Quan Cu = Military Materiel

(Photo Philippe Regenstreif, translation Nathalie Laurent).

Fancy cartridges

8 mm Lebel cartridges were given numerous fancy derivations, coming either to trench artisans, or to merchant souvenir industry, the case is sometimes nickeled and we can also read on certain specimens mention of BREVETE:

- Letter-opener cartridge, with small blade mounted on a balle M jacket, there exist numerous variants;
- Pen-holder cartridge, the pen is mounted to the base of a false bullet;
- Pencil-holder cartridge, also mounted to the base of a projectile jacket;
- Crayon-holder cartridge;
- Thrift cartridge, with vegetable-peeler blade mounted on the cartridge case;
- Oil lamp cartridge;
- Flask cartridge;
- Corkscrew cartridge;
- Wire coil cartridge;
- Lace-up cartridge for ankle boots;
- Lighter cartridge, the case serves as the reservoir, the rim is knurled, a wheel-carrying ring is welded at the level of the neck, the wick passes through the false bullet;
- Pendant associated with buttons or badges;
- Airplane whose fuselage is constituted of an 8 mm Lebel cartridge;
- Pen-holder cartridge with stand welded to the tin, it is formed of a hunting button;
- Etc.

We can also see a false balle D in red bakelite, which houses a micro-film with images of the battlefields of the First World War.

Commemorative inert cartridge, chromed case, coppered bullet, marked **AFERHM-ECRA-1990.**

Photos

Letter-opener cartridge (Copyright Jean Huon).

Pen-holder cartridge (Copyright Jean Huon).

Pencil-holder cartridge (Copyright Jean Huon).

Thrift cartridge (Copyright Jean Huon).

Oil lamp cartridge (Copyright Jean Huon).

Open corkscrew (Amand Leveau).

Corkscrew cartridge marked AC DEPOSE PARIS (Copyright Jean Huon).

Mounted corkscrew (Amand Leveau).

Coil cartridge (Copyright Jean Huon).

Lace-up cartridge (Copyright Jean Huon).

Lighter cartridge (Alain Barrellier).

Pendant cartridge (Copyright Jean Huon).

Inert commemorative cartridge (Copyright Jean Huon).

False diorama bullet (Copyright Jean Huon).

Pen-holder cartridge (Copyright Jean Huon).

Airplane (Copyright Jean Huon).